THE
WONDERS
OF
NATURE and ART;
BEING AN
ACCOUNT
OF
Whatever is moſt Curious and Remarkable
throughout the WORLD;
Whether relating to its
ANIMALS, VEGETABLES, MINERALS,
VOLCANO'S, CATARACTS, HOT and COLD
SPRINGS,
And other Parts of NATURAL HISTORY;
Or to the
BUILDINGS, MANUFACTURES, INVENTIONS,
and DISCOVERIES of its Inhabitants.

The Whole collected from the Writings of the beſt HISTORIANS, TRAVELLERS, GEOGRAPHERS, and PHILOSOPHERS, among which are ſome *Original Manuſcripts*; interſperſed with pious OBSERVATIONS and REFLECTIONS; illuſtrated with NOTES, and adorn'd with COPPER-PLATES.

VOL. I.

READING,
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THE
PREFACE.

WE flatter ourſelves, that in the following Work the Reader will find his Expectations anſwer'd, both with regard to Entertainment and Inſtruction. If the great Variety of Subjects treated of can recommend any Performance, ours has certainly that Merit equal to any that has yet appeared in the World; how they are handled muſt be left to the Reader's Judgment. To ſome perhaps the Undertaking may appear a very eaſy Matter, and little more than a Heap of Materials compiled from other Authors; but then let thoſe Perſons conſider how difficult it is to find out the proper Materials, to reduce them into ſome Kind of regular Order, to reconcile the Contradictions of different Writers, to make the Stile uniform, to diſtinguiſh between Truth and Romance, and, in ſhort, to travel through a Labyrinth without any Clue of Thread, without any Conductor.

In the Annotations, we may venture to ſay, there is ſomething to pleaſe every Palate, and that even the Divine and the Philoſopher will not think them unworthy their Peruſal; but in general the Work is calculated for thoſe who have not the Advantage of Libraries, or Leiſure to turn over many Volumes. The Philoſophical Tranſactions *have been of great Service to us throughout the Whole, and we have endeavour'd to make Choice of the Writings of ſuch Authors as have been always reckon'd Perſons of Judgment and Veracity. Sir* George Wheler, Tournefort, *Dr.* Derham, *Dr.* Shaw, *Dr.* Pococke, *the Author of* Spectacle de la Nature, *and many others that might be mention'd, are Authorities ſufficient to be depended on, and ſuch as nobody will call in Queſtion. In what relates to the Mineral Kingdom, we muſt acknowledge our Obligations to the ingenious Mr.* Hill, *who has ſhewn himſelf Maſter of that Subject; and if he ſhould handle thoſe of Animals and Vegatables in the ſame accurate Manner, the Work will undoubtedly be the compleateſt Natural Hiſtory that has appear'd in ours, or perhaps any other Language. Mr.* Moore*'s Travels into the inland Parts of* Africa *have much aſſiſted us in ſpeaking of that Part of the World; and the Reverend Mr.* Smith *has furniſh'd us with many curious Particulars relating to the* American *Iſlands. As to the medicinal Virtues of Foſſils and Vegetables, we have chiefly relied on Dr.* James; *and, in a Word, we have uſed our utmoſt Endeavours*

deavours to make our Collection uſeful in all Families, as well as amuſing.

To enumerate all the Authors from whom we have borrow'd ſomething ſuitable to our Purpoſe would be tedious and unneceſſary, as they are frequently quoted in the Courſe of the Work. All we deſire is a candid Peruſal of it before it be condemned, either as pyratical, or not anſwering to what is promiſed in the Title; and we are perſuaded that the great Number of Plates, with which it is adorn'd, will be a conſiderable Recommendation of it, as young People more eſpecially are delighted with Things of that Nature, and thereby induced to read, and every one is enabled to form the better Idea of what is deſcribed.

We have endeavour'd to avoid, and are not conſcious to ourſelves of any needleſs Repetitions; but if the Reader ſhould find any ſuch, it is hoped he will excuſe them, as it is poſſible the ſame Animal, Vegetable, or Foſſil, may be mention'd under different Names in different Countries. It was almoſt unavoidable indeed, in a Work of this Kind, to make now and then ſome Addition to a former Deſcription, as Particulars happen'd to occur in conſulting various Writers; but in ſuch Caſe we have referr'd to what had been ſaid before, whereby the Reader may find out the whole Account, almoſt as readily as if it had been laid before him in one View.

As to typographical Errors, it is not unlikely that ſeveral may have eſcaped the Eye of the

the Corrector, as many of the Sheets were printed in great Haſte, occaſion'd by their Manner of Publication in weekly Numbers; but theſe a good-natur'd Reader will eaſily amend or excuſe, and upon the whole we do not in the leaſt queſtion that the Volumes will give Satisfaction to the Purchaſer. The moſt material Errata *we know of are the following.*

Vol. III. *p.* 304. *l.* 8. for *cultivated* read *calculated.*

Vol. IV. *p.* 167. *l.* 6. from the Bottom, for *Hands* read *Hairs*; and *l.* 8. from the Bottom, for *Hairs* read *Hand.*

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THE WONDERS OF NATURE and ART, &c.

INTRODUCTION.

OUR Deſign, in the Courſe of the Work we are undertaking, is to conduct the Reader through the ſeveral Countries of the known World, and to give him a View of thoſe *Wonders* which owe their Exiſtence to the *immediate Hand* of GOD, or are the Effect of *Human Art* and *Invention*. We hope he will not be diſcouraged by the ſeeming Length of the Journey; for we are perſuaded he will find ſuch a Variety of entertaining Objects by the Way, as will make him forget its

Tedioufneſs, and fully recompenſe the Pains he may take in climbing over the rugged *Alps*, or traverſing the Deſarts of *Africa*. Beſides, if he does but duly conſider and make proper Reflections on the ſurprizing Works of Providence, as well as thoſe which the Art of Man has produced, he will not only have the Pleaſure of gratifying his Curioſity, but may poſſibly return home with an enlarged Stock both of *Piety* and *Knowledge*.

IN making this *Tour of the Globe*, we ſhall follow the Geographical Diviſion of it into *Four Parts*, beginning with *Europe*, and ſo proceeding to *Aſia*, *Africa*, and *America*. The ſeveral Countries we ſhall have occaſion to mention in each Part of the World ſhall make a ſeparate Chapter, and the Curioſities of each be ranged in their proper Claſſes. But the Reader is not to expect, that every little Country, Territory, or Iſland, will be treated of diſtinctly, becauſe many ſuch will afford nothing worthy of Obſervation, at leaſt nothing ſo very extraordinary and ſurprizing as to fall within the Compaſs of our Deſign. Now and then perhaps we may ſeem a little immethodical, as we ſhall ſometimes croſs over from the Continent to a neighbouring Iſland, or launch into the Ocean, and take a View of the *Wonders of the Deep*. However, we ſhall endeavour as far as poſſible to obſerve a clear and natural Method, and to lead the Reader from one Country to another in ſuch a Manner as to give him the moſt Satisfaction, though he muſt not expect to find all of them equally full of the Curioſities of Art or Nature.

In a Work of this Kind it is not improbable that we may *omit* ſeveral Particulars which ſome may rank amongſt the greateſt Wonders of the World, and *inſert* others which they may reckon trifling, and not worthy of a Place in a curious Collection. This indeed ſeems almoſt unavoidable; ſome Things that deſerve Admiration, out of ſuch a vaſt Number as the World affords, may very eaſily eſcape our Notice; and others may appear to Us of greater Moment, than in the Eyes of thoſe to whom they are more familiar. Add to this, that it is impoſſible to pleaſe every Taſte; and therefore all that we can do in this Caſe is, to make choice of ſuch Articles as have been thought curious and ſurprizing by the greateſt Philoſophers, by the moſt judicious Travellers, and by all who have made the Wonders of Nature or Art the Object of their Studies and Attention.

We have choſen to begin with *Europe*, not only becauſe it is agreeable to the Order in which the Parts of the World are uſually placed, but becauſe it is natural to take a Survey of the *neareſt*, before we viſit the *remoter* Regions of the Earth; though in them the Reader may expect to find the greateſt Entertainment. And as it is reckon'd a Fault in thoſe who travel into diſtant Countries without being firſt acquainted with what is remarkable in their own, we think it proper to give a ſhort Account of the chief Curioſities of the *Britiſh* Iſles, before we paſs over to the Continent.—Thus much may ſerve by way of *Introduction*; let us now proceed to the Work itſelf.

PART

PART I.
Of EUROPE,

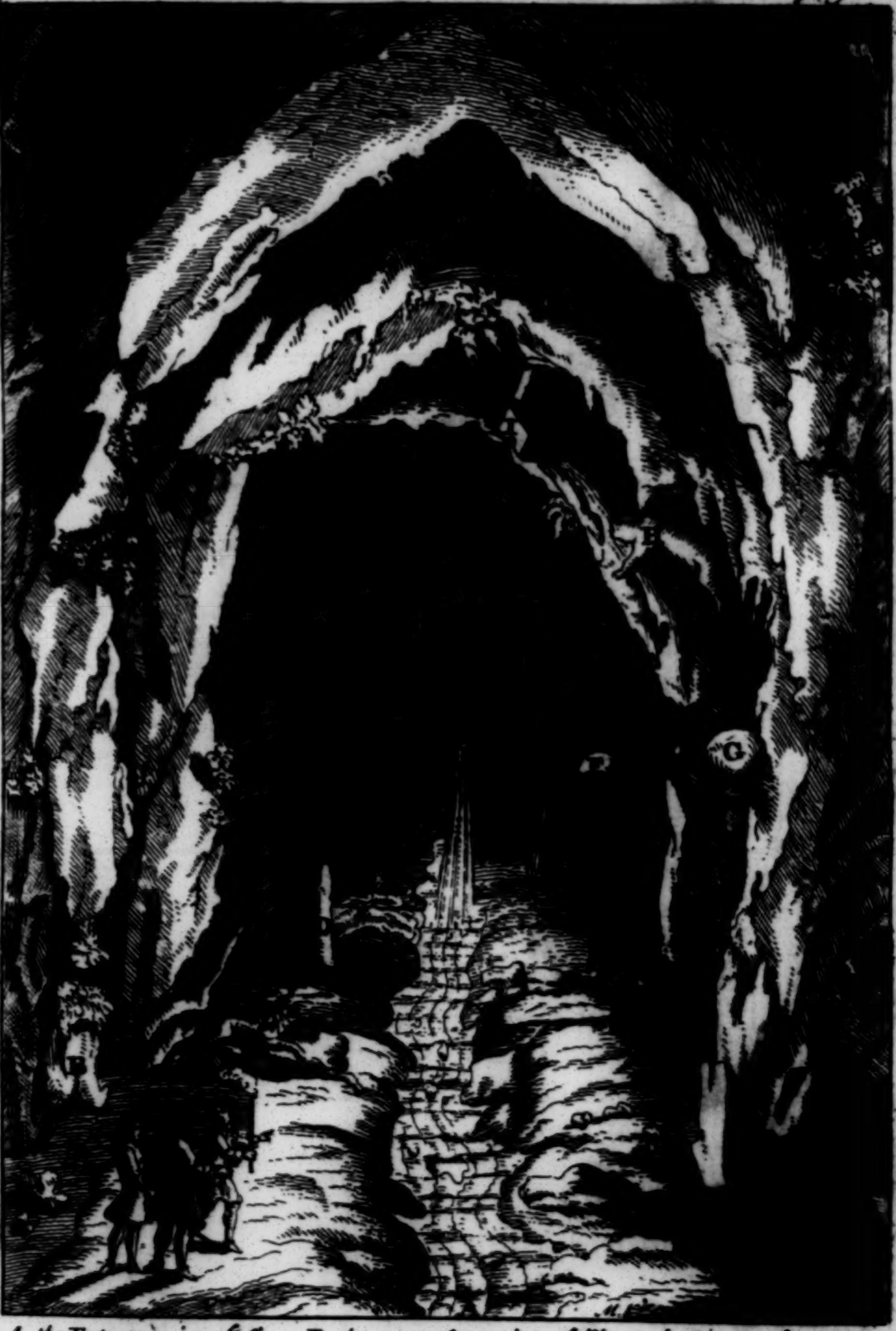
CHAP. I.
Of GREAT-BRITAIN *and* IRELAND.

CAVERNS *and* SPRINGS.

OF all the Natural Curioſities to be met with in *Britain*, none are more famous than thoſe of the *Peak* in *Derbyſhire*, which are very numerous, but few of them are taken notice of except Six, which, with the Duke of *Devonſhire*'s fine Seat at *Chatſworth*, make up the *Seven Wonders* of that Country. The moſt remarkable of theſe is *Elden-Hole*, which is a frightful Chaſm in a Rock, in the midſt of an open Field that has a gentle Deſcent to the South. The Mouth of it is about ſeven Yards over one way, and eighteen or twenty the other; but downwards, as far as can be perceiv'd, its Dimenſions grow leſs and leſs. Its Depth could never yet be diſcover'd, though various Attempts have been made for that Purpoſe. In the Reign of Queen *Elizabeth* the Earl of *Leiceſter* hired a poor Man to venture down in a Baſket, which he accordingly did to the Depth of more than two hundred Yards; but being drawn up again he had loſt his Senſes, and died a few Days afterwards. Mr. *Cotton*, the Author of the *Wonders of the Peak*, let down eight hundred eighty four Yards of Line, (whereof eighty were wet) without being able to find a Bottom; but the Deſcent not being every where perpendicular, on a ſecond Trial the Plummet ſtopt before it reached half that Depth. When Strangers go to ſee this Hole, it is uſual to throw into it large Stones, which are heard to rebound from Side to Side, till the Sound grows weaker and weaker, and is at length entirely loſt.

POOLE's HOLE a ſtupendous Cavern at the Foot of a Mountain, is reckon'd the ſecond Wonder of the *Peak*. The Entrance of it is very low and narrow, but it ſoon opens into a wide and lofty Concavity, like the Inſide of a *Gothic* Cathedral. The extraordinary Height of the Arch is ſurprizing enough, but thoſe who have made it a Quarter of a Mile perpendicular have gone far beyond the Truth, though in Length it exceeds that Dimenſion. The Drops of Water which hang from the Roof, and on the Sides, have an agreeable Effect; for they not only reflect innumerable Rays from the Candles carried by the Guides, glittering like Dew in the Sunſhine, but, being of a petrifying Quality, they harden in ſeveral Places into various Forms, which, by the Help of a ſtrong Imagination,

Pools Hole *or* Cave *and* Elden Hole *page 6*



A. the Entrance into yͤ Cave. B. the repreſentation of Plants in Rocks of a black Bituminous Subſtance. C. the figure of a Lion. D. the Queen of Scots Pillar. E. the fig. of a Human Corps. F. the Sparry globe call'd yͤ Font. G. a Sparry Subſtance call'd Cottons Haycock. H. the Flitch of Bacon. I. the Chair. K. the Needles Eye. All these are form'd by dropping of Water from the Rock: of a Sparry matter call'd Stalactites.

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may paſs for Lions, Organs, Lanthorns, Flitches of Bacon, *&c.* a thouſand of which imaginary Figures are ſhewn you by the Country People. The *Queen of Scots Pillar*, as it is call'd, owes it Origin to the ſame Cauſe. It is clear and bright like Alabaſter, but probably partakes more of the Nature of the Spar* that is found about Lead, with which the Country abounds. This Pillar is the Boundary of moſt People's Curioſity, and is ſaid to have receiv'd its Name from the unhappy Princeſs when ſhe viſited that Place. A Stream of Water runs along the Middle; the Noiſe of which, as it falls among the Rocks, is reecho'd on all Sides, and adds to the Aſtoniſhment of thoſe who viſit this vaſt Concave. The Place takes its Name from *Poole*, a famous Robber, who is ſaid to have lived in this ſubterraneous Apartment, and whoſe Kitchen and Bedchamber they pretend to ſhew you, if you will take the Pains to creep ten or a dozen Yards upon your Hands and Knees.—*Wokey-Hole*, near *Wells* in *Somerſetſhire*, is a Curioſity of the ſame Nature as that we have been deſcribing. It is about two hundred Yards in Length, and the Roof in the higheſt Part is about eight Fathom from the Floor, but in ſome Places it is ſo low that one muſt ſtoop to paſs. The People that ſhew this Cave point to ſeveral pretended Figures of Men and Women, Dogs, Bells, Organs, *&c.* which are owing to the ſame Cauſe as thoſe in *Elden-Hole* above-mention'd. A Current of Water runs through it, in which Trouts and other Fiſh have been obſerv'd; but how they come there it is difficult to conceive. The Echo here is very ſurprizing; and the Place, taken all together, ſeems awful and tremendous.

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* This is a ſhining, ſtony, mix'd Subſtance, which Mr. *Beaumont* (in the *Philoſophical Tranſactions*) takes to be a Kind of Rock-Plant, obſerving that it may be form'd three Ways; 1. either from Steams alone; or, 2. from Steams coagulating Dew as it falls on the Ground, or Water iſſuing from the Joints of Rocks; or, 3. it may grow from Earths and Clays. Inſtances of the firſt Kind are frequent in Grottos, where Spars produced from Steams hang like Icicles, from the Sides of which many times iſſue little Plants ſhooting upwards, contrary to the Tendency of the others. Of the ſecond Kind are thoſe Cryſtals (a Sort of Spars) which are produced by a Coagulation of Dew falling on nitrous Stones. And as to the third Kind, Mr. *Beaumont* gives Inſtances of it in the Mines of *Mendip* Hills, in ſome of which there is a Steam incumbent upon the Earth at the Bottom, from whence ſhoot up little Spires, which grow to the Height of a Man's Finger, the biggeſt about an Inch in Diameter. Theſe Spires begin on the Tops to be congealed, and ſo gathering a Cruſt downwards by Degrees, they are at laſt turn'd into an abſolute white Spar or Stone —Add to this, that Snow, by long lying and continual Froſts, is ſaid to be ſometimes harden'd into Spar.

THE next Wonder is what is uſually call'd the *Devil's Arſe in the Peak*, which is a large Opening in the Side of a ſteep Mountain, almoſt in the Form of an Arch, being above thirty Feet perpendicular, and more than twice that Breadth at the Bottom. There are ſeveral ſmall Cottages built on each Side within the Entrance, whoſe Inhabitants in a great meaſure ſubſiſt by guiding Strangers into the Cavern. Its Width ſoon diminiſhes, for after croſſing one Stream of Water the Roof gradually deſcends, till it is ſo low that a Man cannot ſtand upright under it; but ſtooping for a little Way, and paſſing over another Stream, you find it more lofty. Then proceeding on, you come to a third Rivulet, where the Rock ſtoops, as it were, almoſt to the Surface of the Water, and prevents all farther Search into theſe dark Receſſes. The Vault in ſeveral Places makes a noble Appearance, and being chequer'd with various-colour'd Stones its Beauty is admired by every Spectator.

THERE is a Mountain call'd *Mam Tor* (that is, *Mother Tower* or *Mother Rock)* which is reckon'd among the *Seven Wonders* of the *Peak*, becauſe (ſay they) it is continually mouldering away, and produces other Hills at the Bottom of it, but is not at all diminiſh'd itſelf. The Matter is this: On one Side of the Mountain is a very large and ſteep Precipice, the Subſtance of which being a looſe Earth mingled with ſmall Stones, is continually crumbling and falling down, ſometimes in large Quantities when waſh'd off by heavy Rains, and thus contributes to raiſe a Hill at the Foot of it, the Increaſe of which is eaſily perceiv'd, though the great Mountain is not ſenſibly diminiſh'd: So that this is rather a *fictitious* than a *real* Wonder.

Buxton Wells are alſo reckon'd one of the Wonders of the *Peak*, which beſides their medicinal Virtues have this ſurprizing Particular, that within five Foot of one of the hot Springs there ariſes a cold one. The hot Waters of this Place are preferr'd by Dr. *Leigh* and others to thoſe at *Bath*, the Uſe of them never being attended with the ill Conſequences which have ſometimes been experienced from the latter. The Water is ſulphureous, and contains a ſmall Quantity of ſaline Particles, but none of Vitriol; ſo that it is not fetid, but more palatable than moſt other medicinal Waters; neither is it purgative, becauſe the ſaline Parts are diſpenſed in ſuch ſmall Proportions. The Heat of it is equal to that of the Blood or new Milk, procuring a moderate Perſpiration; and it is remarkable for gently relaxing the Solids, ſo as inſtantly to take off the Stiffneſs and Wearineſs occaſion'd by a Journey. Theſe Waters are often recommended by Phyſicians, both for drinking and bathing, in moſt Caſes that can be relieved by ſuch Methods, particularly in ſcorbutic, rheumatic, or nervous Diſorders. That they were eſteemed in the Time of the *Romans*, appears from a high Road or Cauſey, and the Ruins of the ancient *Roman* Bath, which are ſtill to be diſcern'd. The Duke of *Devonſhire* has built a large and convenient Houſe here for the Reception of Strangers; the Bath-Room is arched over-head, and twenty People may bathe in it at a time. Beſides the principal Springs, which are at the Village of *Buxton*, there are many others that riſe unregarded in the neighbouring Incloſures, and on the Sides of the Hills, ſo that their Number can ſcarce be known.

THE laſt Wonder of this Kind to be mention'd here is *Tideſwell*, or *Weedenwell*, a Spring which, according to ſome Writers, ebbs and flows regularly like the Sea. That it does ebb and flow is certain, but it is at very unequal Periods, ſometimes not once in a Day or two, and ſometimes twice in an Hour. The Baſon of the Spring is about a Yard deep, and the ſame in Length and Breadth. When it flows, the Water riſes with a bubbling Noiſe, as if the Air which was pent up within the Cavities of the Rock was forcing itſelf a Paſſage by driving the Water before it: Or perhaps the Spring may now and then receive an extraordinary Supply from the Overflowings of ſome internal Body of Water, lying upon a higher Level.—But we leave this Phænomenon to be explain'd by Philoſophers.

As we are upon the Subject of *Springs*, let us now conſider thoſe famous ones at *Bath* in *Somerſetſhire*, the great Place of Reſort for our Nobility and Gentry at certain Seaſons, not only for the Cure of Diſeaſes, but for Gallantry and Diverſion. The moſt renowned of theſe hot Springs lie near the Cathedral, and are collected into a ſquare Area call'd the *King's Bath*, about 57 Feet long and 40 broad, with a neat Building before it call'd the *Pump-Room*, for Company to meet in who drink the Water, which is convey'd thither by a Pump from the Bottom of the Springs, where it is almoſt boiling hot*. The Walls of the Bath are full of Niches, perhaps the Work of the *Romans*. There is a Parapet or Baluſtrade with a Walk round it, and Steps to deſcend into it at every Corner. —Behind the South Wall of this Bath is another call'd the *Queen's-Bath*, which is a leſs Square, being 25 Feet long and 24 broad. Its Water, being borrow'd from the former, is of a more moderate Warmth.—In the South-Weſt Part of the Town are two other Baths; one call'd the *Hot Bath*, which is an oblong Square 30 Feet in Length and 13 in Breadth; and the other the *Croſs Bath*†, from a Croſs that formerly ſtood in the Middle of it, which is of a triangular Form. The Over-flowing of this Bath forms another for Lepers and poor People;

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* It is remarkable that at the cleanſing of the Springs, when they ſet down a new Pump, they conſtantly find great Numbers of Hazle-Nuts, which Dr. *Stukely* ſuppoſes to be the Relicks of the univerſal Deluge: And Leaves, like thoſe of Olives, come ſometimes out of the Pump of the *Hot-Bath*.

† In this Bath, when the Weather is very hot, there is ſometimes obſerv'd a certain black Fly ſhaped like a Lady-Cow, which lives under the Water, and is ſuppoſed to come up with the Springs.—The Water of the *Croſs Bath* corrodes Silver very faſt; and the Bath Waters in general will prey upon Iron, but ſeem to have no ſuch Effect upon Braſs.

ple; and a Cold Bath has alſo been erected by Contribution at a Spring beyond the Bridge.

IN the *King's-Bath* there is the Figure of King *Bladud*, with an Inſcription underneath, intimating that this Prince found out the Uſe of theſe Baths three Years before the Coming of our Saviour. But though we cannot give entire Credit to this Inſcription, it is certain they were famous for their medicinal Virtues in the Time of the *Romans*. *Ptolemy* calls them the *Hot Waters*, and *Antoninus* mentions them under the Title of *Waters of the Sun*, to the Influence of which Luminary their Heat was ſuppoſed to be owing; but there is a much more rational Way of accounting for this as well as their other Qualities. Almoſt every one knows, that Heat in any Degree may be produced by a proper Mixture of Sulphur and Filings of Iron, moiſten'd with common Water. Now the Hills from whence the *Bath* Waters flow contain a large Quantity of ſulphureous or bituminous Matter and Iron Ore, which, impregnating the Water as it paſſes through them, give it that *Heat*, *Milkineſs*, and *Detergency* which it ſo eminently poſſeſſes.

IT is ſuppoſed that for many hundred Years theſe Waters were uſed only externally, by way of Bathing; whereas of late the internal Application of them has been found of extraordinary Service in many Caſes*. They have a ſulphureous and ſteely Taſte, and are wonderfully grateful to the Stomach, creating no Heavineſs or Nauſea, but raiſing the Spirits, and procuring an Appetite. They are of ſovereign Uſe in Rheumatiſms, old Aches or Pains, Palſies, nervous Diſorders, and in all Complaints that are comprehended under the Name of *Cold Diſeaſes*. In reſtoring decay'd Conſtitutions they are of ſurprizing Efficacy, as they ſtrengthen the Bowels, recover their loſt Tone, and renew the vital Heat. In a Word, if they are not taken in too large a Quantity*, and a proper Regimen be obſerv'd, they are capable of performing Wonders; though ſometimes, for want of Care in theſe Reſpects, the Uſe of them is attended with ill Conſequences, and their Credit is unjuſtly call'd in queſtion.

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* Though *drinking* the *Bath* Waters, as Dr. *Jones* aſſures us, was practis'd in his Time, about a hundred

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and fifty Years ago; yet the Practice was afterwards ſo univerſally laid aſide, that it was not known at the Reſtoration: Nor was it till the Year 1691, when Mr. *George Long* was ſurprizingly cured of a Conſtitution broken with the Gout and Stone, by the internal Uſe of theſe Waters, that People in general began to drink them, as a great alterative, ſtrengthening, and balſamic Medicine.

* The uſual Quantity is from a Pint to two Quarts in a Morning, according to the Direction of the Phyſician, who ſhould always be conſulted. The Uſe of them for five or ſix Weeks at a time is generally long enough, tho' many have drank them longer with good Succeſs. Thoſe who drink too much commonly loſe their Appetite, and bring upon themſelves a ſick Stomach; but this is remedied by a few Doſes of bitter Wine in a Morning, and a gentle Purge.

THE *Hot-Well*, or Water of St. *Vincent's* Rock near *Briſtol*, muſt not be paſs'd over in Silence. Not many Years ſince, this Spring lay open at the Foot of the Rock, and was cover'd by the Salt Water every Tide; but the Well is now ſecured, a good Pump fix'd in it, and a handſome Houſe built near it for the Entertainment of diſtemper'd Perſons. This Water is of excellent Uſe in all ſcorbutic and inflammatory Caſes, in Hectic Fevers, the Diabetes, and all preternatural Evacuations. It is of Service in the firſt Stages of a Conſumption, and corrects the Acrimony of the Juices, being of a ſoft alcaline Quality derived from the natural Limeſtone with which it is impregnated. It is obſerved to retain its Virtues longer than other Medicinal Waters, which makes the Demand for it the greater by thoſe who cannot have Recourſe to the Fountain-Head; and accordingly vaſt Quantities of it are ſent in Bottles not only all over this Kingdom, but to moſt Parts of the trading World.

THE *Spaw* Waters of *Scarborough* in *Yorkſhire* are now ſo celebrated, that great Numbers of our Nobility and Gentry reſort thither annually, and the Place ſeems to rival even *Bath* itſelf. They operate both by Stool and Urine, like the Waters of *Pyrmont* in *Germany*, having an evident Tincture of Iron, Vitriol, Allum, and nitrous Salt, to which laſt they owe their purgative Quality. They create an Appetite, promote Digeſtion, and gently empty the Bowels, without cauſing Gripes, Sickneſs, or Nauſea, which are frequently the Effects of artificial Purges. In all Kinds of Inflammations, in rheumatic and ſcorbutic Caſes, and in any Weakneſs of the Spermatic or Urinary Veſſels, they are look'd upon as a ſovereign Remedy. They agree beſt with Perſons of ſtrong Nerves, and firm Conſtitutions, but are not proper for thoſe who labour under paralytic, hyſteric, or hypochondriac Diſorders, nor for thoſe who are ſubject to Fits or Convulſions.—The Waters of *Cheltenham* in *Glouceſterſhire* are reckon'd much of the ſame Nature.

HERE it may be proper to mention a remarkable Accident that happen'd at *Scarborough* in *December* 1737, whereby theſe famous Waters had like to have been entirely loſt. The Spring was ſituated at the Foot of a high Cliff, Part of which, about two hundred and twenty-four Yards in Length and thirty-ſix in Breadth, containing near an Acre of Paſture-Land, was on a ſudden rent from the Top of it, and having continued ſinking for ſeveral Hours, at laſt ſettled about ſeventeen Yards perpendicular below its former Situation. By the Preſſure of ſuch a vaſt Weight, being ſome hundred thouſand Tons, the Earth and Sand beyond it towards the Sea, where People uſed to walk who came to drink the Waters, roſe upwards for a hundred Yards in Length, near twenty Foot above its former Level. The *Spaw-Houſe* roſe with the reſt, but the Water ſoon failed and was gone. However, after diligent Search, the Spring was again diſcover'd, and upon Trial its Virtues appear'd to be rather increaſed than diminiſh'd by this Diſaſter.

BEFORE *Scarborough* became in Vogue, *Knareſborough* in the ſame County was much frequented, and is ſtill remarkable for its Mineral Waters, of which there are four Springs, not far diſtant from one another, but very different in their Nature and Effects.—The firſt is the *Sweet Spaw*, or *Vitriolic Well*, diſcover'd about the Year 1620, and allow'd by Phyſicians to be a ſovereign Remedy in ſome particular Diſtempers.—The ſecond is the *Stinking Spaw*, or *Sulphur Well*, the Water of which is clear, but ſo fetid and nauſeous to the Smell, that People are forced to hold their Noſes when they drink it; but it is now chiefly uſed by Bathing. It is ſaid to be good for the Dropſy, Spleen, Scurvy, Gout, Rheumatiſm, and Paralytic Diſorders. —The third is a Cold Bath, call'd St. *Mongah*'s, from a *Scottiſh* Saint much honour'd in thoſe Parts.—The fourth is the *Dropping Well*, the moſt famous of all the petrifying Waters in *England*. It drops from a porous Rock, and the Ground upon which it fell, for twelve Yards long, is now changed into ſolid Stone. The little Rivulet that runs from this Well falls into the *Nid* where it has form'd a Rock that ſtretches ſome Yards into the River.

Tunbridge Wells, in *Kent*, ſhould not be omitted, now we are treating of Medicinal Waters. They are famous for their good Effects in cold chronical Diſeaſes, ſtrengthen the Nerves, and help Digeſtion. In ſhort, their Virtues, and the Pleaſantneſs of the Place, draw much Company thither in the Summer-Seaſon.

THERE are ſeveral other Springs in *England* remarkable for their healing Qualities; but perhaps there is no greater Curioſity of this Kind than the *Burning-Well*, as it is call'd, at *Ancliff* near *Wigan* in *Lancaſhire*. The Water itſelf is cold, nor has it any Smell; but there is a ſtrong ſulphureous Vapour iſſues out with the Water, and makes it bubble up as if it boil'd, which, upon applying a lighted Candle to it, preſently takes Fire, and the Surface of the Well is cover'd with a Flame, like that of burning Spirits. This Flame will continue ſeveral Hours in calm Weather, and emits ſuch a Heat that Meat may be boil'd over it; but the Water, when taken out of the Well, will not burn at all.

Holy-Well, or St. *Winifred*'s Well, in *Flintſhire*, is famous for the wonderful Cures it has effected, particularly upon Cripples, who have frequently left their Crutches there as Monuments of their Recovery. This Fountain iſſues from a Rock into a Cavity form'd like a Baſon or Ciſtern, in which the Patients bathe. The Water is remarkably cold, and the Stream ſo large and rapid, that it turns a Mill a little below its Source. It is well known what extraordinary

ordinary Effects are produced by *Cold Bathing*; but many of the Country-People ſtill believe the Cures wrought by this Well are *miraculous*, and that it owes its Origin (according to an ancient Tradition) to the Blood of a Chriſtian Virgin nam'd *Winifred*, who was beheaded here by a Pagan Tyrant, becauſe ſhe would not yield to his unchaſte Deſires.

Moffat Wells, which ſpring from a Rock near a Town of that Name in *Annandale*, are the moſt remarkable Medicinal Fountains in *Scotland*. There are two of them, not far from each other; the uppermoſt of which runs through whitiſh Stones reſembling Cryſtal, and the lower through blackiſh ones of the Colour of Antimony. Theſe Waters are diuretic, emetic, and cathartic, powerfully removing all Obſtructions of the Bowels, and therefore very good againſt the Cholic and nephritic Diſorders. They are alſo of Service to remove Pains in the Joints, and to heal Ulcers, when outwardly applied. —But enough of Springs; it is now Time to proceed to ſome other Branch of *Natural Hiſtory*.

MINERALS *and* FOSSILS.

AMONG the various Metals and Minerals that *England* produces, none is more conſiderable than its *Tin*, the greateſt Part of the Tin conſumed in *Europe* being procured from the Mines in *Cornwall*. The Chymiſts look upon Tin as a Species of imperfect Metal, generated of two different Seeds, *viz.* that of Silver, and that of Lead, which renders it a Kind of Compound of both; and accordingly it is frequently found both in Lead and Silver Mines: But that it has alſo its own proper Mines, thoſe in the County above-mention'd,as well as in *Devonſhire**, are an abundant Evidence. It is not clear, how long the Tin-Mines have been diſcover'd or work'd; ſome carrying it ſo high as the Time when the *Phœnicians* were a trading People. This however is certain, that the ancient *Britons*, if not the *Romans*, found their Account in them; but they ſeem rather to have been neglected than improved by the *Saxons*. After the coming in of the *Normans*, the Earls of *Cornwall* had vaſt Revenues from theſe Mines, eſpecially *Richard* Brother to King *Henry* the Third. The Tinners were afterwards regulated in ſuch a manner as much contributed to encourage the Adventurers, a Charter being granted by *Edmund*, Earl *Richard*'s Brother, with ſeveral Immunities; who alſo framed and ratified with his own Seal the *Stan*-

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* Though very little Tin is now dug in *Devonſhire*, yet in King *John*'s Time there was more found in that County than in *Cornwall*, the Coinage of *Devonſhire* being then farm'd for a hundred Pounds *per Annum*, whereas that of *Cornwall* yielded but a hundred Marks. And according to this Proportion, the Tenth thereof, amounting to 16*l.* 13*s.* 4*d.* is at this Day paid by the Crown to the Biſhop of *Exeter*.

nary Laws*, laying a certain Duty upon the Tin, payable to the Earls of *Cornwall.* King *Edward* the Third confirmed and even enlarged their Privileges, and erected *Cornwall* into a Dukedom, with which he inveſted his Son *Edward* the *Black Prince*; and ſince his Time the Heirs apparent to the Crown of *England* (if eldeſt Sons) have enjoy'd it ſucceſſively.

THE working of the Tin-Mines is very hard and difficult, not only by reaſon of the great Depth to which they are ſometimes obliged to ſink their Shafts or Pits, even as low as threeſcore Fathom; but alſo becauſe the Rocks they ſometimes meet with, thro' which a Paſſage is to be cut, are ſo hard that the Workman can ſcarce dig a Foot in a Week. The ſoft ſhaking Earth found in theſe Mines is alſo very troubleſome to the Miners, on account of the unwholeſome Vapours it exhales, and the Currents of Water that frequently iſſue from it. When the Ore is dug and drawn out of the Mine, it is there broke to pieces with large Hammers, and then carried to a Stamping-Mill, where it is pounded ſtill ſmaller, and the Water, paſſing through waſhes away the earthy Parts, leaving the Metallic ones behind. This done, they dry it in a Furnace on Iron-Plates, and grind it to Powder in a Craſing-Mill; after which they waſh it again, and dry it; and in this State the metallic Matter is call'd *Black* Tin. To convert it into *White* Tin, that is into Metal, they carry it to a Furnace or Blowing-Houſe; where, by means of a Charcoal Fire, kept up by huge Bellows worked by Water, it is ſmelted; and when it is cold they forge it, which is the laſt thing done to it in the Works. Two Pounds of black Tin, when melted, yield about one of white.—It is remarkable, that the Droſs or Scoria ſcumm'd off the Tin in Fuſion, and melted down with freſh Ore, runs into Metal; and even the Matter waſh'd and ſeparated from the Metal in the Mill, being thrown up in Heaps, after reſting ſix or ſeven Years, will, by fetching it over again, (as they term it) yield as good Tin as that of *Germany*.

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* Theſe are Laws relating to the Tinners and Tin-Mines, which from *Stannum* (Tin) are call'd *Stannaries.* In *Cornwall* there are five Stannary-Courts, which have their reſpective Juriſdictions, and as many Towns where the Tin muſt be brought to be ſtamp'd, which ſtamping they call *Coinage*, for which a certain Duty is paid. The Stamp is the Seal of the Dutchy, and the Towns are *Leſkard*, *Leſtwithiel*, *Truro*, *Helſton*, and *Penzance.* The Coinage-Towns in *Devonſhire* are *Plimpton*, *Taviſtock*, *Aſhburton*, and *Chagford.* When all the legal Duties are ſatisfied, the Tinner may ſell his Tin where he thinks fit; only if the King or the Duke of *Cornwall* have a mind to buy it, they have a Right of Pre-emption.

BUT there is another Mineral found in theſe Mines, call'd *Mundick*, which the Tinners uſed carefully to ſeparate from the Tin, becauſe it made it thick and curdy; and ſo it was thrown aſide and neglected as a Thing of no Value.

In the laſt Century, however, Sir *Gilbert Clark* and others began to make Trial of the Mundick, and found it afford as good Copper as that of *Sweden:* And the Work is now brought to ſuch Perfection, that the Copper extracted from this uſeleſs Ore (as it was thought to be for many Ages) now brings in annually above 150,000*l.*—The Mundick emits a ſuffocating Vapour, very troubleſome to the Miners; and yet it is found to be a good Vulnerary; for they uſe no other Remedy for their Wounds but waſhing them in Water that runs from the Mundic Ore.

LEAD, though found in various Countries, abounds particularly in *England*; but of all the Mines thoſe in *Derbyſhire* and *Somerſetſhire* are the moſt remarkable. It will be ſufficient to take notice of thoſe in the laſt-mention'd Country, which are in *Mendip*-Hills*, and afford vaſt Quantities of this uſeful Metal. The Ore ſometimes runs in Veins, ſometimes diſperſed in Banks, and often lies between Rocks.

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* It ſeems any *Engliſhman* may work in theſe Mines, who has not forfeited his Right by ſtealing any Ore or Tools belonging to another Workman. In caſe of ſuch Theft their Cuſtom is very remarkable. The Criminal is ſhut up in a ſlight Hut, ſurrounded with dry Furze, Fern, &c. which being ſet on Fire, he is permitted to break down the Hut, and make his Eſcape through the Flame as well as he can, but muſt never work or be employ'd any more about the Mines of that Place. This they call *Burning the Hill.*

Some of it is harder, ſome ſofter. There is a Spar about it, which is white, tranſparent, and brittle like Glaſs; and another Subſtance they call *Crootes*, a white Stone, ſoft, mealy, and marl'd with Ore. That Ore is beſt which is cleareſt and heavieſt; whereof thirty-ſix Hundred will yield about a Ton of Lead. The Soil about theſe Mines is red and ſtony; and the Stones that are waſh'd by the Brooks and Springs are ponderous, and of a reddiſh Colour.

THE *Groovers* (for ſo the Miners are call'd, as the Shaft of a Mine is call'd a *Groove*) work in Frocks and Waiſtcoats by the Light of Candles, which, if they have Air enough, will laſt three or four Hours. They ſeldom meet with Damps, but now and then Water breaks in upon them; in which Caſe they drive an Adit, or new Paſſage, upon a Level, till it is dry. To empty the Water out of the Mines they uſe Leather Bags that will hold eight or nine Gallons apiece, which are drawn up to the Top by Ropes. The Tools they work with are ſo harden'd as to make an Impreſſion upon the Head of an Anvil, and yet they often break them in an Hour's time. When they meet with a black Stone they reckon it a bad Sign, as leading to a Rock that will hinder their Works; the Nearneſs of which is alſo indicated by a ſhort brittle Clay. Having got the Ore out of the Mine, they beat it ſmall, waſh it in a running Stream, and ſift it in Iron Rudders.

ders. Then upon a Hearth or Furnace (which is made of Clay or Fireſtone, and ſet in the Ground) they lay a Quantity of Oaken Gads, which they light with Charcoal, and blow with Bellows work'd by Mens Feet. When the Fire-plate is hot, they throw the Ore on the Wood, which melts down into the Furnace, from whence they take it out with an Iron-Ladle, and caſt it upon Sand into what Form they pleaſe. The Smoak of the Lead-Works is a very great Annoyance to the Workmen, and ſubjects them to a mortal Diſeaſe, as it does the Cattle if ſuffer'd to graze thereabouts. The Trees that grow near them have their Tops burnt, and their Leaves and Bark diſcolour'd and ſcorch'd. But to prevent as much as poſſible the Inconvenience of Smoak upon a ſhifting Wind, they have Furnaces for melting the Ore about five Foot high, fix'd upon Timber ſo as to be turn'd about like a Windmill. In this they put the Ore with a ſtrong Coal-Fire upon it, and as it melts, it runs through a Canal on one Side, leaving the Earth, Stone and Scoria with the Aſhes of the Coals.

NEAR *Wrinton* in this County are Mines of *Lapis Calaminaris*, or *Calamine Stone*, which is of ſome Uſe in Medicine*, but more in Foundery, being uſed to convert Copper into Braſs.

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* It is aſtringent, deſiccative, and deterſive; much uſed for taking off Films from the Eyes of Horſes, &c.

It is uſually dug out of the Mines in ſmall Pieces, having frequently Eyes and ſometimes Veins of Lead. When dug, it is waſh'd in running Water, which carries off the impure and earthy Parts, leaving the Lead, Calamine, and other ſparry Parts at the Bottom. It is then put into a Sieve, and well ſhaken in Water; after which it is baked in an Oven four or five Hours, then beaten to Powder and ſifted; and thus it is fit for Uſe.——The Manner of making Braſs is this: The Calamine being calcin'd as above, and reduced to a fine Powder, is mix'd with ground Charcoal, and incorporated into a Maſs. Thus prepared, about ſeven Pound of Calamine are put into a Melting-Pot, and over it about five Pounds of Copper; which is let down into a Wind-Furnace eight Foot deep, and having remain'd there eleven or twelve Hours is converted into Braſs. After melting, it is caſt into Plates or Lumps.

ABOUT *Mendip* Hills there is great Plenty of *Coal*, which almoſt every one knows to be a black, ſulphurous, inflammable Matter, dug out of the Earth, and ſerving as common Fuel. It is to be found indeed in moſt Parts of *Europe*, but the *Engliſh* Coal is of greateſt Repute even in foreign Countries, and makes a conſiderable Article of our Commerce. The *Mendip* Coal-Mines, according to Dr. *Beaumont*, (who lived among thoſe Hills, and was a curious Enquirer into the Works of Nature) are very much ſubject to *Fire-Damps**, by which many Men have been kill'd, maim'd, or miſerably burnt. Some have been blown up at the Mouth of the Works; and the Turn-Beam, that hangs over the Shaft of the Pit, has been thrown off its

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* Mr. *Jeſſop*, in the *Philoſophical Tranſactions*, gives an Account of four Sorts of Damps in Mines. The firſt and moſt common is that whoſe Approach the Workmen are ſenſible of by the Flame of the Candle's becoming orbicular, and leſſening by degrees till it goes quite out; as alſo by their Shortneſs of Breath. Thoſe who eſcape ſwooning receive no great Harm thereby; but thoſe who ſwoon away, though they are not quite ſuffocated, are tormented with violent Convulſions on their firſt Recovery. The ordinary Remedy is to lay the Perſon down on his Belly, with his Mouth to a Hole dug in the Ground; but if this fail, they make him drink his Fill of good Ale; and if that will not do, they judge his Caſe deſperate.—The ſecond is the *Peaſe-Bloom* Damp, ſo call'd from its Smell, which never happens but in Summer-Time, and is not found to be mortal. The Miners in the *Peak* ſuppoſe it to proceed from the red Trefoil-Flowers, call'd by them Honeyſuckles, which grow thereabouts in great Abundance.——The third is the moſt peſtilential and moſt ſtrange of all; for they ſay it is ſeen hanging to the Roof of thoſe Paſſages in a Mine that branch out from the main Groove, in a round Form as big as a Foot-Ball, and cover'd with a Skin like a Spider's Web. If this be broken by any Accident, the Damp immediately flies out, and ſuffocates all that are near it; therefore the Workmen, by the Help of a Stick and a long Rope, have a Way of breaking it at a Diſtance; after which they purify the Place well with Fire before they venture in again. They imagine it to be the Steam ariſing from their Bodies and the Candles, which condenſing in the

Frame by the Violence of the Blaſt. To prevent theſe Miſchiefs the Miners uſe no Candles in their Works but thoſe of a ſingle Wick, ſixty or ſeventy to the Pound, which yet gives as great a Light there, as thoſe of ten or twelve

higheſt Part of the Vault, at length contracts a Film, corrupts, and becomes peſtilential.—The fourth, call'd the *fulminating* or *Fire-Damp*, is a Vapour which being touch'd by the Workmens Candles preſently takes fire, giving a Report like a Gun, and producing all the Effects of Lightning. The Smoke proceeding from this Damp is of the Smell and Colour of that from Gunpowder. It is ſometimes found in Lead-Mines, but moſt frequently in Coal-Pits.

Naturaliſts give us very ſurprizing Accounts of the Effects of Damps, a few Inſtances of which may perhaps be agreeable to the Reader. In the *Hiſtory of the Academy of Sciences*, An. 1710, we are inform'd that a Baker of *Chartres*, having carried ſeveral Buſhels of Aſhes into a deep Cellar, his Son going down afterwards with more, the Candle went out on the Middle of the Stairs; but having lighted it again, he went to the Bottom, where he cried out for Help, and they heard no more of him. His Brother, an able Youth, ran down after him, cried out he was dead, and was heard no more. He was follow'd by his Wife, and ſhe by a Maid, and ſtill it was the ſame. This ſtruck the whole Neighbourhood with a Panic, and no body cared to venture any farther, till a reſolute Fellow, perſuaded the four People were not dead, would go down to their Aſſiſtance; but he alſo cried out, and did not return. Upon this another Man got a Hook, and without going to the Bottom drew up the Maid; who having taken the Air, fetch'd a Sigh and died. Next Day a Perſon undertook to get up all the Bodies with a Hook, being let down by a Rope on a wooden Horſe, to the Pound do in other Places; and they always put them behind them, never preſenting them to the Breaſt of the Work.—The ſame learned Naturaliſt obſerved, that ſome Coal-Veins were much more tinged with Sulphur

to pull up whenever he gave Notice. He ſoon call'd, but the Rope breaking he fell into the Cellar, and was drawn out dead preſently after. At length the Phyſicians being conſulted gave their Opinion, that the Aſhes or Brands had not been well extinguiſh'd, and the Cellar (like the reſt in *Chartres*) abounding with Salt-petre, the unuſual Heat had raiſed a malignant Vapour which had done the Miſchief; and that the Remedy was to throw in a good Quantity of Water. This being done, a Dog and a lighted Candle were let down without Injury to either; a ſufficient Proof that the Danger was over.

What Dr. *Connor* relates is ſtill more wonderful, *viz.* That as ſome People were digging in a Cellar at *Paris* for ſuppoſed hidden Treaſure, the Maid went down to call her Maſter, and found them all ſtark dead, but in their working Poſtures, and ſeemingly intent on their ſeveral Offices, one digging, another ſhovelling away the Earth, *&c.* The Wife of one of them was ſat down on the Side of a Hopper, leaning her Head on her Arm, as if weary and thoughtful; and a Boy, with his Breeches down, was evacuating on the Edge of the Pit. All of them, in ſhort, appear'd in their natural Poſtures and Actions, with open Eyes, but ſtiff as Statues, and cold as Clay.

We ſhall conclude this Note with an Account of a remarkable Damp in a Well in the Iſle of *Wight*, as given us by Mr. *Cook* in the *Philoſophical Tranſactions*. In 1733 a Farmer employ'd ſome Workmen to ſink a Well, who, about eighteen Feet from the Surface, dug through a Stratum of a mineral Mixture without any Inconveniency; nor were they at all incommoded in carrying on the Work, till about twelve than others; and ſpeaks of one that was wrought in theſe Mines, which had received ſuch a Reſplendency from its ſulphureous Tincture, that in all its Points it ſeem'd as if it was cover'd with Leaf-Gold. He adds, that in one of theſe

Days afterwards, when towards the Evening they were annoy'd with a faint ſuffocating Heat, which, as they were drawn up, was moſt remarkably perceiv'd againſt the mineral Stratum abovemention'd The next Morning a young Man letting himſelf down by a Rope, as ſoon as he came over-againſt the ſame Stratum, became incapable of ſuſtaining his own Weight, fell to the Bottom, and died immediately. Another young Man, not ſuſpecting the Cauſe, having ſeated himſelf acroſs a Stick fix'd to the Rope for that Purpoſe, was let down to his Friend's Aſſiſtance; but when he came to the ſame Depth, he was obſerv'd to give the Rope a great Shock, fell down as the other had done, and ſoon expired. A third Perſon, being tied faſt in a large Baſket, was let down more warily; and when he came to the ſame Stratum, finding himſelf almoſt ſuffocated, he cried out, and was drawn up again immediately; but remain'd in the Air near Half an Hour, pale, panting, and ſpeechleſs. In three Hours time the dead Bodies were drawn up, but brought up ſuch a diſagreeable Stench along with them, as made ſeveral of the Workmen vomit. The next Day a Cat was let down, and at the ſame Place ſeiz'd with Convulſions; but being drawn up again, quickly recover'd.—The Well was left open about eight Months, in hopes the Damp would leave it; but it became worſe, riſing even to the Top, where it appear'd like a thin white Fog when the Air was moiſt, and in a dry Air could be perceiv'd like a warm Breath, always diffuſing a ſulphureous Stench, affecting People with Giddineſs, Shortneſs of Breath, and a Propenſity to vomit: So that at laſt the Well was fill'd up, being not only uſeleſs but offenſive.

Works two or three hundred Weight of very good Lead-Ore was found growing to a Vein of Coal, which was reckon'd a great Rarity; none having ever been met with in a Coal-Pit before, the ſulphureous Spirit being there generally too ſtrong for the Generation of that Metal.

FROM theſe Mines, and thoſe of *Kingſwood* in *Glouceſterſhire*, the City of *Briſtol* is ſupplied with Coals; but no Part of *England* affords ſuch prodigious Quantities of this ſerviceable Mineral as the Pits about *Newcaſtle* upon *Tyne*. It is almoſt impoſſible to expreſs the vaſt Trade which this Town carries on in this ſingle Article; for their Coals are not only ſent by Sea to many other Parts of *England* and *Scotland*, but alſo to *Holland*, and in Time of Peace to *France* and *Flanders*; and being thus brought to us by Shipping they are commonly call'd *Sea-Coal*, though *Pit-Coal* is the more proper Name. But to give the Reader a juſt Idea of the wonderful Conſumption of *Newcaſtle* Coal, we need only inform him, that from this inexhauſtible Source the City of *London* is ſupplied, which alone is reckon'd to conſume annually at leaſt 600,000 Chaldrons, each Chaldron containing ſix and thirty Buſhels. Nor ſhould we forget the Coal-Pits near *Whitehaven* in *Cumberland*, which is the moſt eminent Port in *England* for its Coal-Trade, *Newcaſtle* excepted. From hence the City of *Dublin*, and all the Towns of *Ireland* on the Coaſt, as well as ſome Parts of

Scotland and the Iſle of *Man*, are wholly ſupplied: So that in Time of War, or upon account of contrary Winds, it is no uncommon Thing to have two hundred Ships at once ſet ſail from this Place for *Dublin* laden with Coals.

UNDER this Article we ought not to omit a remarkable Sort of Coal, call'd *Cannel* or *Candle-Coal*, which is found in ſome of the Northern Counties, particularly in *Lancaſhire*. It is gloſſy, and light; apt to cleave into thin Flakes; and, when kindled, yields a continual Blaze till it is conſumed to Aſhes. Its Hardneſs makes it capable of being poliſh'd, and then it looks like Marble; ſo that Standiſhes, Cups, Candleſticks, *&c.* are frequently made of it: Nor will it Soil the fineſt Handkerchief, tho' it is as black as Jet.—There is another uncommon Kind of Coal dug up in *Staffordſhire*, call'd *Peacock-Coal*, becauſe, when turn'd to the Light, it ſhews all the Colours in the Peacock's Train; but it is too ſoft to be poliſh'd.

THERE remains yet a very uſeful Metal to be mention'd, of which our Iſland affords no ſmall Quantities, I mean *Iron*; and ſome of our *Engliſh* Iron is very good, though the Preference is generally given to that of *Sweden*. This Metal conſiſts of an Earth, Salt, and Sulphur, but all impure, ill-mix'd, and ill-digeſted; which renders it extremely liable to ruſt. It is the hardeſt, drieſt, and moſt difficult to melt of all Metals. It may be ſoften'd by heating it often in the Fire, hammering it, and letting it cool of itſelf; and it is harden'd by being extinguiſh'd in Water.—Of all the Iron-Works in *England*, thoſe in the Foreſt of *Dean* in *Glouceſterſhire* are in moſt Repute. The Ore is found there in great Plenty, differing much in Colour, Weight, and Goodneſs. The beſt, call'd *Bruſh Ore*, is blueiſh, very ponderous, and full of little Specks that ſhine like Silver. This affords the greateſt Quantity of Iron, but if melted alone the Metal is very brittle, and therefore not ſo fit for common Uſe. To remedy this, they mix with it a due Quantity of *Cinder*, (which is the Refuſe of the Ore after the Metal has been extracted) and this gives it ſuch an admirable Temper of Toughneſs, as makes it equal to any that is brought from foreign Countries.—After they have dug up the Ore, their firſt Buſineſs is to calcine it, which is done in Kilns, much like our ordinary Lime-Kilns. Theſe they fill to the Top with Coal and Ore, a Layer of each alternately; then ſetting fire to the Bottom, they let it burn till the Coal is waſted, and renew the Kilns with freſh Ore and Coal in the ſame manner as before. This does not melt the Metal, but conſumes the more droſſy Part of the Ore, and makes it malleable; ſerving inſtead of the beating and waſhing uſed with other Ores. After this Operation it is carried to the Furnaces, which are built of Brick or Stone, about thirty Feet high, and ſomewhat reſembling the Shape of an Egg, being about ten Feet wide in the Middle, but much narrower at the Top and Bottom. Behind the Furnace are fixed two huge Pair of Bellows, the Noſes of which meet at a little Hole near the Bottom: Theſe are work'd by a large Wheel turn'd about by Water, and are ſo contrived as to play alternately, the one giving the Blaſt whilſt the other is riſing. The Furnace is fill'd with Ore and Cinder, intermix'd with Charcoal, which being ſet on fire, the Materials run together into a hard Cake or Lump; and the Metal, as it melts, trickles down into Receivers at the Bottom of the Furnace, where there is a Paſſage open for the Men to take out the Scum and Droſs, and let out the Metal as they ſee Occaſion. Before the Mouth of the Furnace lies a great Bed of Sand, wherein they make Furrows of what Shape they pleaſe; and when the Receivers are full the Metal is let into them, which is made ſo very fluid by the Violence of the Fire, that it not only runs to a conſiderable Diſtance, but keeps boiling a good while afterwards. In this Manner they keep the Furnaces conſtantly employed for many Months together, never ſuffering the Fire to ſlacken Night or Day; but ſtill pouring in at the Top a freſh Supply of Ore and Fuel, which in theſe Works is always Charcoal. And from hence the Sows and Pigs of Iron, as they call them, are carried to the Forges, where they are wrought into Bars.

WE muſt not leave this Part of Natural Hiſtory without taking notice of a foſſil Earth, commonly call'd *Fuller's Earth*, which ſeems almoſt peculiar to *England*, and is of great Uſe in the Woollen Manufacture*. Plenty of it is dug up near *Brick-Hill* in *Staffordſhire*; alſo near *Ryegate* in *Surry*, near *Maidſtone* in *Kent*, near *Petworth* in *Suſſex*, and near *Wooburn* in *Bedfordſhire*. It is a fatty Kind of Earth, abounding in Nitre; and is ſo neceſſary to the well-dreſſing of Cloth, that though Foreigners may procure our Wool in a clandeſtine Manner, they can never come up to the Perfection of *Engliſh* Cloth without Fuller's-Earth, the Exportation of which is therefore made equally criminal with that of Wool.—Abroad they make great Uſe of Urine inſtead of Fuller's-Earth.

THE ſubterraneous Productions already mention'd (to which we may add Marble, Freeſtone, &c.) are ſome of the moſt uſeful that our Iſland affords; nor can we be more particular on this Head, without exceeding our intended Limits. But their is a great Variety of Foſſils to be found in the Bowels of the Earth, which, though of no apparent Service to Mankind, excite our Admiration, and afford Matter for curious Speculations and Enquiries. By theſe we do not mean the *native* Foſſils, which have their ſeveral Uſes, and will be occaſionally taken notice of in the Courſe of this Work; but thoſe of the *adventitious* or *foreign* Kind, which have not been generated in the Earth, but repoſited there by Earthquakes, Deluges, or ſome other extraordinary Cataſtrophe. Theſe are Trees*, Plants, Shells, Bones, Teeth, *&c.* both of Sea and Land Animals, which are found in great Abundance in ſeveral Parts of the Earth. Sometimes we find whole Beds of Shells†, either of the ſame or of different Kinds; ſometimes Fiſhes petrified; and the Branches and Leaves of Trees, Sea-Moſſes, *&c.* either petrified or impreſs'd on Stones in their perfect Shape and Proportion. Theſe extraneous Foſſils have very much employ'd the Thoughts of our later Naturaliſts, who find it no eaſy Matter to account for the ſurprizing Phænomena of petrified Sea-Fiſhes in Places far diſtant from the Sea, and even on the Tops of Mountains; Shells in the Midſt of Quarries of Stone; Elephants Teeth, and Bones of Animals peculiar to the Southern Climates, and Plants only growing in the Eaſt, found in our Northern and Weſtern Parts. The common Opinion is, that the Foſſils of this Kind were buried in the Earth at the Time of the univerſal Deluge; but ſome think they are only the Effect of a *Luſus Naturæ*, the Mimickry or wanton Productions of Nature.

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* It is alſo reckon'd a great Improver of Land. When diſſolv'd in Vinegar it diſperſes Pimples, checks Inflammations, and cures Burns.

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* Some time ago there were found in *England*, at the Depth of above a hundred Feet, ſeveral huge Oaks, remaining entire with their Branches. They had contracted a Blackneſs equal to that of Jet, and a Hardneſs far ſurpaſſing that of any living Oak. How theſe Trees ſhould come there, unleſs by a Subverſion of the whole Globe at the Time of the Flood, it is difficult to conceive.—Mr. *Boyle* mentions a vaſt Oak dug out of a Salt-Mine in *Tranſylvania*, ſo hard that it could not eaſily be wrought on by Iron-Tools; which yet, by being expoſed to the Air, became ſo rotten in four Days as to crumble between the Fingers: And Mr. *Derham* obſerves the ſame of the Trees turn'd out of the Earth by the Breaches at *Weſt-Thurrock* and *Dagenham*.—M. *de la Pryme* is of Opinion, that the Trees which are found under Ground in *Hatfield Chace* in *Yorkſhire*, and in the Moraſſes and Fens in ſeveral other Counties, were cut down by the *Romans*, in order to diſlodge the *Britons* who uſed to ſhelter themſelves in the thick marſhy Woods, and ſally out as Opportunity offer'd to intercept their Proviſions and diſturb their Garriſons.

† We have a remarkable Inſtance of this Kind near *Reading* in *Berkſhire*, where a continued Stratum or Layer of Oyſter-Shells is found at a great Depth from the Surface of the Earth. They

Dr. *Woodward*, in his *Natural Hiſtory of the Earth*, ſeems to have ſet this Matter in a pret-

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lie in a Bed of greeniſh Sand, upon a hard rocky Chalk, and are often dug out entire by the Men who work in the Chalk-Pit, and thoſe who viſit the Place out of Curioſity. The Shells are brittle, and eaſily ſeparated from each other; but nothing is found within them, except now and then ſome of the green Sand abovemention'd. What makes this the more wonderful is the Diſtance of the Place from the Sea, which is not leſs than forty or fifty Miles; ſo that they are generally ſuppoſed to have been left there by the univerſal Deluge.

ty clear Light, though his Syſtem is liable to ſome Objections. He imagines, that the whole Maſs of Earth, with every thing belonging thereto, was ſo broken and diſſolved at the Time of the Flood, that a new Earth was form'd in the Boſom of the Water, conſiſting of different Strata or Beds of Matter, ranged over each other, nearly according to the Order of their ſpecific Gravities*. By this means Plants, Animals, (eſpecially Fiſhes) Shells, Bones, *&c.* not yet diſſolved among the reſt, became blended with the mineral and foſſil Matters, which either preſerved them entire, or aſſumed and retain'd their Figures and Impreſſions. He farther ſuppoſes, that theſe Strata were originally parallel, even, and regular, and render'd the Surface of the Earth perfectly ſpherical;

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* Dr. *Leigh*, ſpeaking of the Coal-Pits in *Lancaſhire*, denies the Strata to lie according to the Laws of Gravitation. This induced Mr. *Derham* to make a nice Enquiry into the Matter; and accordingly he cauſed divers Places to be bored, laying the ſeveral Strata by themſelves, and afterwards weigh'd them with great Accuracy to determine their ſpecific Gravities. The Reſult was, that in his Yard the Strata were ſpecifically heavier the lower they went; but making the ſame Experiment in his Fields, he could not perceive any Difference in the ſpecific Gravities of the ſeveral Strata. Having acquainted the Royal Society with this, their Operator Mr. *Hawkſbee* was order'd to try the Strata of a Coal-Pit, which he did to the Depth of thirty; and found (as appears from the Account he gives us in the *Philoſophical Tranſactions*) that they lay in no manner of Order as to their Gravities, but confuſedly, as if the Mixture was purely caſual.

but that, towards the End of the Deluge, they were broken on all Sides of the Globe, and their Situation varied, being elevated in ſome Places and depreſſed in others; whence Mountains, Valleys, Iſlands, *&c.* and thoſe vaſt Cavities into which the Waters retired and form'd the Ocean. In a Word, the whole terraqueous Globe (according to the Doctor) was put, by this Diſruption of the Strata, and the Depreſſion of ſome and Elevation of other Parts, into the Condition wherein it now appears.

BUT though moſt of the Foſſils reſembling Shells, Plants, *&c.* may reaſonably be ſuppoſed to owe their Origin to the univerſal Deluge, there are ſome which are probably native Stones or Rock-Plants, and not Parts of Animals or Plants petrified, as many Naturaliſts have imagined. The *Trochitæ*, or *Trochites*, for Inſtance, vulgarly call'd *St. Cuthbert's Beads*, ſeem to be of this Kind. They are commonly of a dark Colour, gloſſy and ſhining when broken, and are eaſily diſſolv'd in Vinegar. Their Figure is generally cylindrical, ſometimes a little tapering, and the flat Ends are cover'd with fine Radii drawn from a Hole in the Middle to the Circumference. Several of theſe are ſometimes join'd together, in ſuch a manner that the Rays of one enter into the Furrows of another. They are found in ſome Parts of *Yorkſhire*, and alſo in *Mendip-Hills*, ſometimes ſcatter'd here and there, and ſometimes in large Beds, and of various Sizes. Mr. *Beaumont* (in the *Philoſophical*

Tranſactions) aſſures us, that all the Cliffs in ſome Mines are made up of theſe Stone-Plants; and that they are found growing in the gritty Clay, ſome of them yet crude and ſoft, others of the Conſiſtence of Lime-ſtone, others ſtill harder, with the evident Beginnings of Circles and Sutures, and others become perfect Spar, which is their State of Maturity. Many of theſe, as to the Curioſity of their Make, may vie with any of the vegetable Kingdom, having Roots, Stem, Branches, Joints, an inward Pith, and ſometimes Cells to ſupply the Place of Veins and Fibres.

THE *Aſtroites*, or *Star-Stone*, which is found about *Shugbury* in *Warwickſhire*, near *Belvoir-Caſtle* in *Lincolnſhire*, and in ſeveral Parts of the North of *England*, is a Curioſity of the like Nature. Their Form is very regular, conſiſting of ſeveral thin pentagonal Joints ſet one over another, ſo as to make a Kind of five-angled Column.—To this Species of Bodies may alſo be referr'd the Stone call'd *Cornu Ammonis*, which, according to Dr. *Beaumont*, is frequent in the Clay wherein the *Trochitæ* are produced, and at its firſt Appearance looks like a young Cock's Spur, but grows to the Length of ſeven or eight Inches, though few of that Bigneſs are to be found entire. Dr. *Woodward* however is of a different Opinion, aſſerting it to be a Shell of the *Nautilus* Kind, form'd in the Sea, and carried thence by the Waters of the Deluge. It is rough, knotty, and twiſted like a Ram's-

Horn, whence its Name, *Jupiter Ammon* being worſhipp'd by the antient People of *Libya* under the Form of a Ram.—The *Cornu Ammonis* and the *Aſtroites*, being immerged in Vinegar or the Juice of Lemons, will move about as if they were alive; the Reaſon of which is, that the Acid, by inſinuating itſelf into their Pores, makes Way for the Introduction of a warmer Air than what was lodged therein before; which being immediately dilated, and ſtruggling to diſengage itſelf, occaſions a tremulous Motion in thoſe Bodies.

UNDER this Article, as we are ſpeaking of Stones, it ſeems proper to mention a Curioſity in *Ireland*, about eight Miles from *Colerain*, which has obtain'd the Name of the *Giant's Cauſeway*, though it is evidently the Work of Nature. It conſiſts of many thouſand Pillars, moſt of them ſtanding perpendicular to the Plane of the Horizon, and very cloſe to each other. Moſt of them have five Sides, ſome ſix, and others ſeven, and yet their Contexture is ſo adapted, that there is no Vacuity between them. They are from fifteen to twenty-four Inches in Diameter, and are compoſed of ſeveral Joints or Pieces of different Lengths, the convex End of one being exactly fitted to the Concavity of another. The Sides of the Pillars, which touch each other, are of a whitiſh Freeſtone Colour, but upon breaking off ſome Pieces the Inſide appears like dark Marble, pretty much reſembling that which the Ancients call'd

Baſaltes;

Baſaltes. This Cauſeway runs from the Bottom of a Precipice into the Northern Ocean, how far is not known; but at low Water it is viſible at leaſt ſix hundred Feet in Length, the Breadth in the wideſt Place being about two hundred and forty Feet, and in the narroweſt a hundred and twenty. In ſome Parts it is fifteen or twenty Feet, in others ſix and thirty, above the Level of the Strand.

VEGETABLES.

WE come now to conſider ſome of the vegetable Productions of our Iſland, which in general being ſo well known, we need only deſcribe a few of the moſt remarkable. We ſhall begin with *Saffron*, which is chiefly cultivated about *Walden* in *Eſſex*, from whence the Town is generally call'd *Saffron-Walden*. It riſes from a bulbous Root, and bloſſoms in *September* and *October*. Its Leaves are long, narrow, thick, and ſoft to the Touch; and its Flower, which ſometimes appears before the Leaves and ſometimes after them, is of a pale Purple ſtreaked with whitiſh Lines; but towards the Bottom of the Petala the Purple is deeper. From the Middle of the Flower ariſe three flame-colour'd Stamina or Chives, crown'd with their Apices; and under theſe is the Ovary or Piſtil of the Plant, wherein the Seeds are form'd. From the upper Part of the Ovary ariſes the Style, a ſlender Tube incloſed within the fiſtular Part of the Flower; where it is of a whitiſh Colour, but changes into Yellow before it divides into three Parts oppoſite to the Tops of the Stamina. Theſe three Stylets (or Darts, as ſome call them) are the true Saffron of the Shops, for the ſake of which alone the Plant is cultivated. When the Flower is gather'd, they ſeparate the Stylets, and dry them in Sieves by a gentle Fire, or on a little Kiln made for that Purpoſe. It is remarkable, that though every Flower ſeems to yield ſo little, an Acre of Ground will produce about a hundred Pounds of wet Saffron, which will weigh twenty Pounds when dried and fit for Uſe. They uſually plant it three Years in one Piece of Ground, and then remove it to another. The *Engliſh* Saffron is reckon'd the beſt in *Europe*[*].

Woad, which is much uſed in dying blue Colours[†], is produced from a Plant call'd *Glaſtum*, whoſe Leaves reſemble thoſe of Ribwort-Plantain. It is much cultivated in *Bedfordſhire*, where they order it in the following Manner.

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[*] Good Saffron is known by its agreeable Smell, being velveted over with a fine Red, and free from yellow Threads. It is uſed both in Food and Medicine, to chear, fortify, and reſolve. It is an excellent Cordial, and a ſure Promoter of a Diaphoreſis.

[†] The ancient *Britons* uſed to dye their Bodies with a Tincture of this Plant, to make them appear formidable to their Enemies, or perhaps to defend them againſt the Inclemency of the Weather.

The Seed is ſown annually in the Spring, and the Leaves are cropp'd for the firſt Time about the Middle of *May*, and perhaps three or four times afterwards, eſpecially in a wet Summer, though the beſt is produced in a dry Seaſon. The firſt Crop excels all the reſt in Goodneſs, every one after it being gradually worſe. When gather'd, the Crop is ground ſmall in a Mill, and having laid eight or ten Days in Heaps, it is made into Balls, which are dried on Hurdles, and then ground to Powder. This done, it is ſpread on a Floor and water'd, which is call'd *Couching*; and then by turning it every Day it is *ſilver'd*, that is, render'd perfectly dry and mouldy, when it is put up in Bags for the Dyer's Uſe.

THE *Hop*, a Plant of the reptile Kind, whoſe Flower is a principal Ingredient in Malt-Liquors*, is cultivated in ſeveral Parts of *England*, eſpecially in *Kent* and *Surry.* This Plant creeps upon the Ground, unleſs it find Pales or Shrubs to hang to, or is ſupported by Poles ſtuck in the Ground for that Purpoſe, which is the Method uſed in the Hop-Gardens. Its Stem is long, flexible, rough, and hairy; its Leaf indented like that of the Vine, and cover'd with a Kind of prickly Down; and its Flowers, which grow in a Sort of Bunch or Cluſter, are of a greeniſh Yellow, reſembling thoſe of the female Elm, both as to Form and Size. The Flower contains a blackiſh bitter Grain, which is the Seed of the Hop; but it is uſually propagated by Sets, eight or ten Inches long, having each three or four Joints. Theſe are ſet in Holes about a Foot ſquare, one at each Corner, and a fifth in the Middle; and theſe little Plantations, which are form'd into a Kind of Hillocks, are made at the Diſtance of ſix or eight Feet from one another. When the Hops are two or three Feet above Ground, they are conducted and tied to the Poles, but not ſo cloſe as to hinder their climbing; and about Midſummer, when they begin to branch, ſuch as have not reach'd the Tops of the Poles ſhould have their Heads nipp'd off, that they may branch the better. They blow towards the End of *July*, and the forward ones are ripe by the Cloſe of *Auguſt.* Their Ripeneſs is diſcover'd by their fragrant Scent, their changing Colour, being eaſily pull'd, and by the browniſh Colour of the Seed. If they are over-ripe, they will be apt to ſhed their Seed, wherein their chief Strength conſiſts; nor will they look ſo green, but ſomewhat brown, which much leſſens their Value. When gather'd they are dried on a Kiln, and about a Month afterwards are pack'd up in Bags, wherein they will keep ſeveral Years.

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* The Uſe made of Hops in the Liquor drank in cold Countries, and the Manner of raiſing them on Poles, has given the Plant the Appellation of the *Northern Vine*. By this Ingredient, which affords a ſubtil grateful Bitter, our Beer is preſerved to a great Age, being prevented thereby from running into ſuch Coheſions as would make it ropy, vapid, and ſour. It alſo divides and ſubtilizes the viſcid Parts of the Malt, and ſo renders them more eaſy of Digeſtion and Secretion in the Body.——The Heads and Tendrils of the Plant purify the Blood in the Scurvy, and moſt cutaneous Diſeaſes; Decoctions and Syrups made of the Flowers are good againſt peſtilential Fevers; Juleps and Apozems are alſo prepared with them for hypochondriacal and hyſterical Affections, and to promote the Menſes.

BUT perhaps none of our vegetable Productions (except thoſe which furniſh us with Bread, the moſt neceſſary Part of our Food) are of greater and more univerſal Uſe than *Flax* and *Hemp*, which are Plants of much the ſame Nature, though the firſt is abundantly finer, and employ'd in more beautiful Manufactures.---*Flax* is a Plant with a ſlender hollow Stem, uſually about two Foot high, whoſe Bark conſiſts of Fibres or Threads, which being dreſs'd and work'd in a proper Manner affords us that valuable Commodity *Linen-Cloth*, which we now make to very great Perfection; and the *Iriſh* in particular have of late Years improved that Manufacture to ſuch a Degree, that they export great Quantities of it to *England*, and to the *Britiſh* Colonies in *America*. Flax thrives beſt in a Soil that has long lain fallow, and the Seed muſt be ſown thick in a warm Seaſon about the End of *March* or the Beginning of *April*. The Seed* brought from the Eaſt is beſt, and though it be dear it abundantly repays the Charges. Flax pull'd up in the Bloom is whiter and ſtronger than that which ſtands till the Seed is ripe. Inſtead of ſteeping it in a ſtanding Water, (as they do Hemp) it is uſually expoſed alternately to the Damps of the Night and the Heat of the Sun, from whence it receives a finer Colour; after which it is well dried, and undergoes much the ſame Preparations as Hemp to fit it for ſpinning.—*Hemp* grows much taller than Flax, riſing into a ſlender Sort of Shrub, with a hollow Stem, and the Leaves a little jagged. Its Seed* (which is well known) grows on the Top of the Stem, but is only produced by Hemp of the male Kind, commonly call'd *Karl*, as the Female is call'd *Fimble*. But the moſt valuable Part is its fibrous Bark, which, after undergoing various Operations, yields us Thread, Cloth, Cordage, *&c.* The Seed is uſually ſown in *May*, and the Plant is fit to gather in *Auguſt*, its Ripeneſs being indicated by the Stalks turning white and the Leaves yellow. The Way of gathering it is to pull it up by the Roots, after which it is tied up in Bundles, and laid to ſteep in a Pool, or other ſtagnant Water, to rot the Bark; which done, it is taken out again and well dried. It is then cruſh'd with an Inſtrument call'd a *Brake*, to break the dry Bun or Hex, which is the inward Subſtance of the Stem; and when it is thus reduced to ſuch a State as to hang together in ſmall Shivers, theſe are ſeparated from the Bark by beating it with a Swingle, a Piece of Wood edged for that Purpoſe. The next Operation is to beat the Hemp on a Block with Beetles, till it be ſufficiently ſoft and pliable; after which it is heckled, that is, drawn though ſeveral tooth'd Inſtruments of different Fineneſs, whereby the ſhorter Tow is ſeparated, and the reſt is fit for ſpinning, weaving, *&c.*—Upon the whole, it is ſurprizing to conſider what numberleſs Advantages Mankind enjoy from the two little Plants we have been ſpeaking of, and even from their Bark alone. This affords us a Part of Attire which accommodates us Day and Night, and is not only neat and convenient, but contributes much to the Health of our Bodies. From hence we have thoſe ſpreading Sails, by the Help of which our Ships are wafted to the remoteſt Parts of the Globe; and from the ſame Bark the Ropes by which they are managed, and the ſtrong Cables for their Anchors, ſo neceſſary to their Security. In a Word, the Materials form'd from the Rind of theſe Plants are of conſtant and univerſal Uſe in domeſtic Affairs, Huſbandry, Commerce, and moſt Arts and Manufactories.

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* The Seed of Flax, call'd *Linſeed*, enters into the Compoſition of divers Medicines, and yields an Oil by Expreſſion which has moſt of the Properties of Nut-Oil, and, in defect of that, is frequently uſed in Painting. That drawn cold is reckon'd good in ſeveral Diſeaſes.

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* A Decoction of Hempſeed in Milk is recommended againſt the Jaundice. The Leaves are ſaid to be good againſt Burns, and the Juice thereof againſt Deafneſs.

SOME perhaps might think us guilty of an unpardonable Omiſſion, if we ſhould forget to mention the famous Hawthorn at *Glaſtonbury* in *Somer-*

Somerſetſhire, ſaid to put forth Bloſſoms every *Chriſtmas-Day*, and to have firſt taken Root there from a Staff which *Joſeph* of *Arimathea* fix'd in the Ground. That there was a Thorn near *Glaſtonbury* which in very mild Winters uſed to bloſſom about that Time of Year, is undoubtedly true; but the Report of its blooming always exactly on *Chriſtmas Day* is entirely groundleſs. The Tree was cut down long ago, (ſome Time in the laſt Century) but ſeveral Branches of it were planted in the Neighbourhood, which grew and bloſſom'd like the old one, and are ſtill to be ſeen in the Gardens of the Curious*.

ANIMALS.

FROM *Vegetables* we now proceed to *Animals*; but as an Account of thoſe which are well known amongſt us (how ſurprizing ſoever they might appear to Strangers) would be inſipid and tireſome to an *Engliſh* Reader, we ſhall not ſpend much Time on this Head, reſerving Room for a more particular Deſcription of ſuch Creatures as are peculiar to foreign Countries, and therefore more apt to excite our Admiration.—In the firſt Place we think proper to mention a Curioſity, which perhaps has not been taken notice of by any Author; but the Truth of it we have heard atteſted by a Perſon of Veracity, who was himſelf an Eye-witneſs of what he relates. There is (he ſays) in the Poſſeſſion of a certain Family near *Highworth* in *Wiltſhire* an uncommon Breed of Geeſe, which the Owners take ſo much Care to preſerve to themſelves, that they would ſcarce part with an Egg upon any Conſideration. Theſe Geeſe they nurſe up and fatten in ſuch a manner, that they grow to a very extraordinary and almoſt incredible Size, inſomuch that ſome of them will weigh twenty, five and twenty, and even thirty Pounds. They are uſually beſpoke by Gentlemen who have the Curioſity to grace their Tables and entertain their Friends with ſuch a noble Diſh; and conſidering the Rarity of the Fowl, as well as the Expence of feeding them, the Price of one Shilling a Pound, which is the loweſt they are ſold at, does not ſeem extravagant.

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* Mr. *Ray*, an excellent Botaniſt, was of Opinion, that this miraculous Thorn (as many have look'd upon it to be) differ'd only accidentally from the common Hawthorn.

HAVING mention'd this uncommon Sort of tame Geeſe, it naturally leads us to deſcribe a remarkable Species of wild ones, call'd *Solan Geeſe*, which at a certain Seaſon of the Year frequent ſome of the Iſlands on the Coaſt of *Scotland*, and particularly a ſmall one call'd the *Baſs**, which is little elſe but a Rock, about a Mile in Circumference. Incredible Flocks of theſe Fowls reſort hither in the Summer, a few always coming beforehand, as if it were to chuſe their Habitations, which for that Reaſon are term'd *Scouts*. The People there take care not to diſturb them till they have built their Neſts, after which they are not to be frighten'd away by any Noiſe whatever. They lay but one Egg, which they fix ſo nicely to a Point of the Rock in the Middle of the Neſt, that if it be removed 'tis impoſſible to fix it ſo again. This Egg they hatch by holding it faſt under one Foot, and ſeldom leave it till that is done. The young ones are of an Aſh-Colour, but the old ones are white, and at their full Growth they are rather bigger than an ordinary Gooſe. Conſiderable Profit is made by their Feathers, as well as by their Fleſh, which is reckon'd a Dainty; but as they are exceeding fat, and taſte like Herring, which is their chief Food, it is hard to conceive how they can be ſo delicious. They have a Neck like a Crane, and a ſtrong ſharp Bill about four Inches long, with which it is ſaid they ſtrike ſo violently at their Prey, that it ſometimes ſticks faſt in a Board baited for that Purpoſe with a Herring, and ſo they are taken before they can

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* This little Iſland was formerly the Poſſeſſion of the *Lauder* Family, but purchaſed by King *Charles* the Second, and annex'd to the Crown. It is inacceſſible on all Sides, except by one narrow Paſſage, at the Top of which there was a Fort mounted with Cannon, which

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has been neglected ever ſince the Revolution. At that Time it was ſurprized by ſome of King *James*'s Party, and held out for him the laſt of any Place in the three Kingdoms.

diſengage themſelves. Whither theſe Birds retire in Winter is not known.

ACCORDING to Mr. *Martin*, ſeveral of the Weſtern Iſles of *Scotland* are alſo frequented by vaſt Numbers of *Solan Geeſe*, particularly *St. Kilda*, *Soa*, and *Borera*. The Inhabitants of theſe little Iſlands, the two laſt of which are not above a Mile in Compaſs, annually take about 20,000 of theſe Fowls, which they keep in Storehouſes built for that Purpoſe; and their Eggs they preſerve ſome Months in the Aſhes of Peat. The Eggs they eat raw, and eſteem them a good Pectoral. The Fat of the Gooſe is an excellent Vulnerary; and a Pudding made of it, and boil'd in Water-Gruel, they reckon a Specific againſt Coughs. Theſe Birds (our Author ſays) are leſs than Land-Geeſe; whereas thoſe of the *Baſs* are bigger, as we have before obſerved. They ſtay about theſe Iſlands till *September*, build in high Rocks, go in queſt of Food, and hatch by turns. They will fly above thirty Leagues to fiſh for Herrings, returning to their Neſts with five or ſix entire in their Gorges, which they caſt up to feed their Young. They ſleep with their Heads under their Wings, and always have one to keep Watch; which if the Fowler happens to ſurprize, as is often the Caſe, the reſt of the Company are eaſily taken by the Neck one after another.

IN theſe Iſlands there is another remarkable Bird call'd a *Fulmar*, of a grey Colour, and about the Size of a Moor-hen. It has a ſtrong

Bill, with wide Noſtrils, and is ſuppoſed to pick its Food out of Whales at Sea, the Fleſh of which, as well as Sorrel, is found in its Neſt. This Bird, when any-one comes near it, ſpouts out of its Bill a Quantity of pure Oil, which the Natives, when they catch the Fowl with Gins, have a Method of receiving in Veſſels, and not only burn it in their Lamps, but uſe it as a Remedy for Rheumatic Pains, to diſcuſs Tumors, and for Purging and Vomiting.

In ſome of the Iſles of *Orkney* are found the *Claik-Geeſe* or *Barnacles*, which are cover'd with a Shell, and ſtick to Trees by the Bill, from whence they are ſaid to derive their Nouriſhment. Mr. *Martin* ſays he ſaw many of them, but never perceiv'd any upon the Tree with Life in them; though the Natives inform'd him they had obſerved them move with the Heat of the Sun. Sir *Robert Moray* ſays they hang at the Tree by a Neck longer than the Shell, of a kind of filmy Subſtance, ſomewhat reſembling the Wind-pipe of a Chicken. In every Shell he open'd he found a perfect Sea-Fowl, with a little Bill like that of a Gooſe, Feet like thoſe of Water-Fowl, and the Feathers all plainly form'd; but he never ſaw any of thoſe Birds alive. Strange Stories have been told, and too readily believed, concerning the Barnacles; as that they grow upon Trees by the Sea-Side in Shells, out of which the Birds, when come to a proper Degree of Maturity, make their Paſſage and drop into the Water. Others have ſuppoſed them to be produced from rotten Wood that has floated long in the Sea, or from certain Fruits falling into the Water, contrary to the New Philoſophy, which explodes equivocal Generation*. Others again have aſcribed their Origin to a Kind of Sea-Shells adhering to old Planks and Bottoms of Ships, which from thence are call'd *Conchæ anatiferæ*; but theſe Shells in reality contain an Animal of their own Species, as well as the Oyſter, Muſcle, or other Shell-Fiſh. The Truth ſeems to be, that the Barnacle is not a marine Animal or Fiſh, (as ſome have imagined) but a real Gooſe, and oviparous, like other Fowls: But thoſe who make it the ſame with a Bird the *French* call *Macreuſe*, or *Diable de Mer*, are undoubtedly miſtaken†.

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* By this is meant a Method of producing Animals, not by the uſual Way of Coition between Male and Female, but by a certain Power or Virtue in the Sun, &c. Thus Maggots, Flies, Spiders, Frogs, &c. have been ſuppoſed to be produced by the Sun's warming, agitating, and impregnating the Duſt, Earth, Mud, and putrified Parts of Animals. This *equivocal* Method of Generation, which is alſo call'd *ſpontaneous*, was commonly believed by the ancient Philoſophers; but the Moderns, from more and better Obſervations, unanimouſly reject it, and maintain that all Animals, and Vegetables too, are *univocally* produced, that is, by Parent Animals, and Vegetables of the ſame Species and Denomination.

† Sir *Robert Sibbald* has fallen into this Miſtake, as Dr. *Robinſon* obſerves; who takes theſe Birds to be of a different Species, the *Barnacle* of the Gooſe, the *Macreuſe* of the Duck, and the *Diable de Mer* of the Hen Kind. The ſame Author

JUST before the South Promontory of the Iſle of *Man* lies a little Iſland call'd the *Calf of Man*, reſorted to at one Time of the Year by a vaſt Number of *Puffins*, a Sort of Sea-Fowl that breed there in the Holes of the Rabbits, which abandon them to theſe Viſitors for that Seaſon. When the young ones are ready to fly, which is about the Middle of *Auguſt*, the Natives hunt them, as they call it, and take annually about four or five thouſand. The old ones fly out to Sea all Day, where having got their Prey, and digeſted it in their own Stomachs, they diſgorge it into thoſe of their Young; for when the young ones are open'd, nothing is found in them but a digeſted Oil, or Leaves of Sorrel, ſo that they are almoſt one Lump of Fat. The greateſt Part of them are conſumed by the Inhabitants, but ſome are pickled in an elegant Manner, and ſent abroad as Preſents.

As we are now ſpeaking of Wild Fowl, it ſeems not improper to take notice of the vaſt Numbers of the aquatic Kind, particularly the Duck, Mallard, Teal, and Widgeon, which are taken in the Fens of *Lincolnſhire* and the neighbouring Counties. The Manner of taking them in *Decoys* (as they are call'd) into which they are enticed by Ducks bred up tame for that

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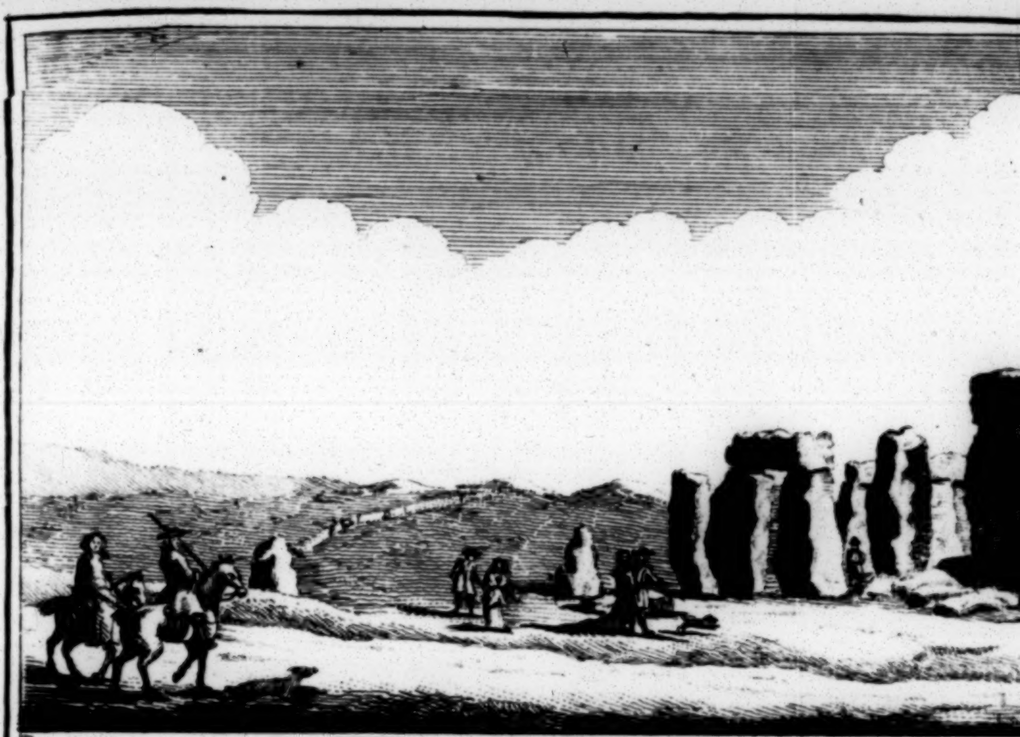
ſhews, that the *Macreuſe* is no other than the *Scoter*, or *Anas niger minor*, deſcribed by Mr. *Ray*; contrary to the Opinion of M. *Cattier*, who took it for the greater *Coot* of *Bellonius*; and of others, who ſuppoſed it a Sort of *Colymbus* or *Diver*.

Purpoſe, is curious enough, and very profitable to the Inhabitants. The Decoy-Ducks being brought up in the Decoy-Ponds, and fed conſtantly at certain Places, become at length ſo familiar with their Feeder as to take their Meat out of his Hand; and as they are not confin'd, they fly abroad and return again at Pleaſure. At the proper Seaſon of the Year theſe ſubtle Creatures take frequent Flights, and ſometimes, after being abſent ſeveral Weeks, return home with a very numerous Company, invited (as is ſuppoſed) from *Holland* or other Parts of the Continent, to partake of their Entertainment. As ſoon as the Decoy-Men perceive they are ſettled in the Pond, and that their Numbers are increaſing, they go ſecretly to the Side of the Pond, under the Cover of Hedges made with Reeds, and then throw over Handfuls of Corn into ſuch ſhallow Places as the Decoy-Ducks are acquainted with, to which they reſort and entice the Strangers. Thus they are entertain'd without any Diſturbance for ſeveral Days, the Bait being ſometimes thrown in one Place, ſometimes in another, till at length they are led inſenſibly into a narrower Part of the Pond, where the Trees on each Side hang over-head like an Arbour, though at a good Height from the Water. Here the Boughs are ſo artfully managed, that a large Net is ſpread near the Tops of the Trees, and faſten'd to Hoops which reach from Side to Side; but the Paſſage is ſtill ſo wide and ſo lofty, that the Fowls do not perceive the Net above them. The Decoy-Man, keeping unſeen behind the Reeds, goes forward, throwing Corn into the Water, which the Decoy-Ducks greedily fall upon, and encourage their foreign Gueſts to follow them, till by degrees they are all got under the Arch or Sweep of the Net, which imperceptibly grows lower and narrower till it ends in a Point like a Purſe, perhaps two or three hundred Yards from the firſt Entrance. When the Decoy-Man ſees they are all ſufficiently within the Net, on a ſudden a Dog, which till then keeps cloſe by him, and which is perfectly taught his Buſineſs, ruſhes from behind the Reeds into the Water, ſwimming directly after the Ducks, and barking as he ſwims. Immediately the frighted Ducks take Wing, but being beat down again by the Net, they neceſſarily ſwim forward to avoid the Dog, till at laſt they are hurried into the Purſe, where they fall a Prey to the Decoy-Man who there waits to receive them.—By this means incredible Numbers of Wild Fowl are taken every Week during the Seaſon, moſt of which are ſent up to *London*; inſomuch that ſome of the Decoys are rented at four or five hundred Pounds *per Annum*.

WE might eaſily enlarge upon this Subject, and give an Account of remarkable Quadrupeds, Fiſhes, Inſects, *&c.* which are the Production of *Britain* and the *Britiſh* Seas; but this would require a Volume of itſelf, and be running beyond our Deſign, which is only to deſcribe a few of the *greateſt*, not *all* the Curioſities of every Country; and therefore we proceed to take a View of ſome of the Remains of Antiquity with which our Iſland abounds.

ANTIQUITIES.

ONE of the greateſt Wonders of this Kind is *Stonehenge*, a famous Pile or Monument of huge Stones on *Saliſbury* Plain, about ſix Miles diſtant from that City. Antiquaries are very much divided in their Opinions concerning the Origin and Uſe of this ſurprizing Fabric. Many of them take the Stones to be artificial, and to have been made on the Spot, thinking them too unwieldy for Land-Carriage; but *Inigo Jones* is poſitive they are all natural, and whoever examines the Grain of them exactly will be of his Opinion. This celebrated Architect, in a Treatiſe publiſh'd in 1658, ſtrives hard to perſuade us that it was a *Roman* Temple. Others, reading the Name *Stone-Hengiſt*, maintain it to have been a Monument erected in Memory of *Hengiſt*, the firſt General of the *Saxons* in *England*. Some will have it to have been the Burial-Place of *Ambroſius*, King of the *Britons*; and others that it was raiſed by that Prince in Memory of the *Britons* who were there ſlaughter'd by the *Saxons*. But no Author has handled this Matter ſo fully and clearly as Dr. *Stukely*, who ſeems to have made it more than probable that it was a Temple of the *Britiſh*



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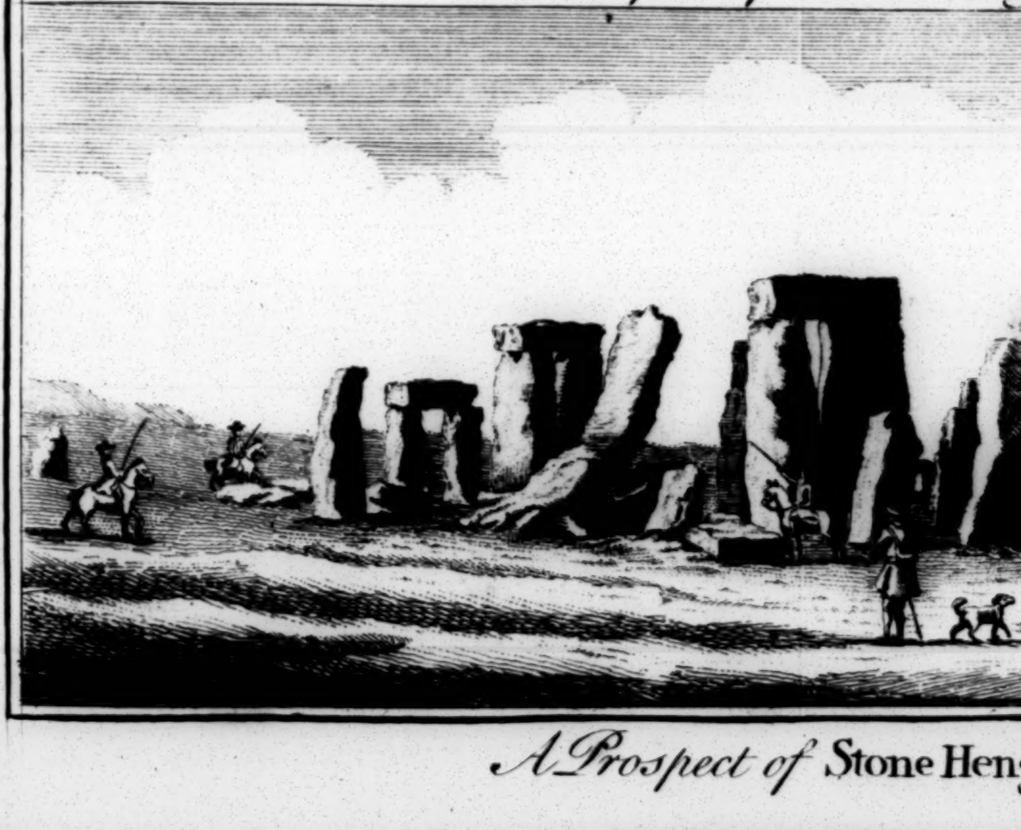

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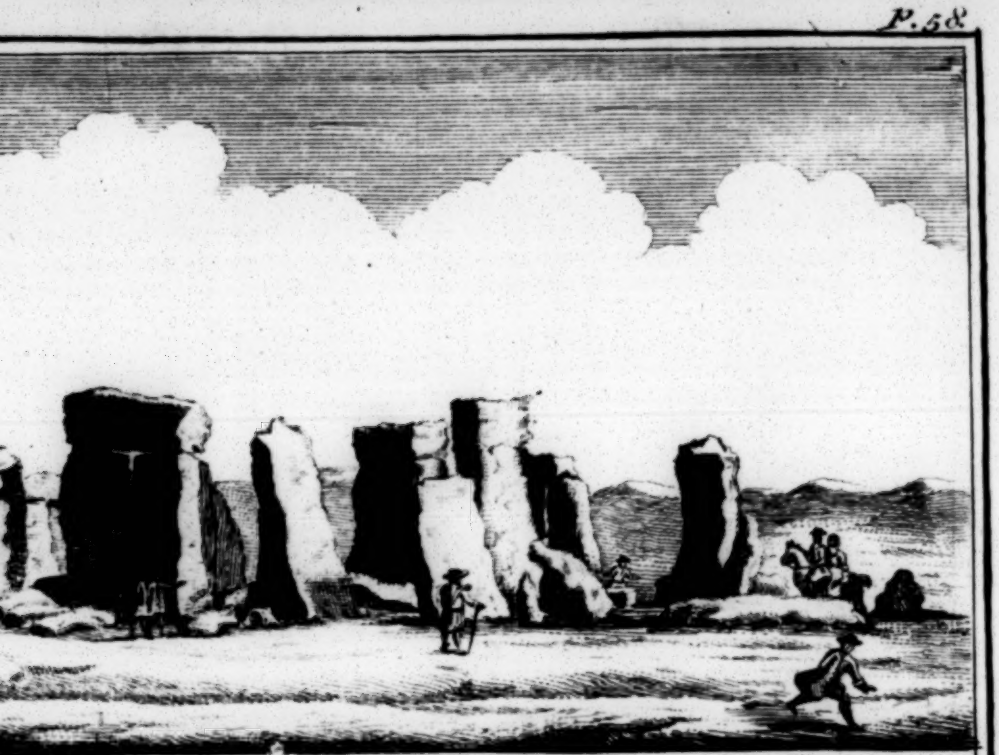
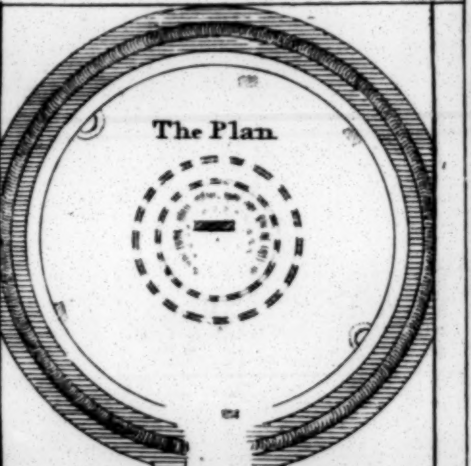


e Henge *from the West.*

ne Henge *from the South.*



tiſh Druids*, and the chief of all their Temples in this Iſland. We ſhall therefore borrow a ſhort Account of it from the Doctor's learned Diſſertation on this Subject.

Stonehenge is ſituated on a riſing Ground, and makes a grand and awful Appearance, eſpecially as we approach it on the North-Eaſt, which Side remains moſt perfect. It is encompaſs'd by a circular Ditch or Trench, which having paſs'd, we aſcend thirty-five Yards before we come at the Work itſelf. The Whole conſiſts of four Circles of Stones, or rather two Circles and two Ovals, the outermoſt being about a hundred and eight Feet in Diameter. Of the outer Circle, which originally conſiſted of ſixty Stones, that is thirty Uprights and thirty Impoſts, there are ſeventeen Uprights left ſtanding, ſix of which have Impoſts upon them, and two more are ſtill to be ſeen lying upon the Ground, and alſo ſix more Uprights. Theſe Stones are of a vaſt Bulk, the Uprights being nine Cubits high, excluſive of the Impoſts; and the Cubit is about twenty Inches *Engliſh* Meaſure.—The inner Circle, which is about eight Feet diſtant from the firſt, conſiſted of forty leſſer Stones, which never had any Impoſts. They are flat Parallelograms, like thoſe of the outer Circle; and nineteen of them are yet ſtanding. They are a Cubit thick, and two and a half high, being juſt half as big as the Uprights of the outer Circle. The Walk between theſe two Circles, which is a hundred Yards in Circumference, muſt have been very noble and delightful when this wonderful Structure was entire.

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* The *Druids* were the Prieſts or Miniſters of Religion among the ancient *Britons*, *Gauls*, and *Germans*; and being choſen out of the beſt Families, the Honours of their Birth, together with thoſe of their Function, procured them the higheſt Veneration. Nor had they only the Adminiſtration of ſacred Things, but were the Judges and Arbiters of all Affairs indifferently, both publick and private; and ſuch as diſobey'd their Deciſions were excommunicated, which was their principal Puniſhment. Every Nation had an *Arch-Druid*, or High-Prieſt, who acted with abſolute Authority over all the reſt. We know but little as to their peculiar Doctrines, only that they believed the Immortality of the Soul. They ſtudied Aſtrology, Geometry, Natural Philoſophy, and Morality; and being in the greateſt Eſteem, the *Britiſh* and *Gauliſh* Youth flock'd to them for Inſtruction. The Children of the Nobility (according to *Mela*) retired with them into Caves and Foreſts, where they ſometimes lived twenty Years under their Tuition. They preſerv'd the Memory of the Actions of great Men in their Verſes, which they never allow'd to be wrote down, but made their Pupils learn them by heart. They had the Miſletoe in ſingular Veneration, gathering it every Year with abundance of Ceremony. Hiſtory informs us, that upon ſome extraordinary Occaſions they offer'd human Sacrifices; but the Cuſtom was condemn'd by *Auguſtus*, and entirely aboliſh'd by the ſucceeding Emperors.

WITHIN theſe Circles are the two Ovals, which are the principal Part of the Work, here being the *Adytum*, or Cell, into which we may ſuppoſe none but the upper Order of Druids were to enter. This is compoſed of what the Doctor calls *Trilithons*, each of which conſiſts of two upright Stones ſupporting another laid acroſs their Heads and join'd by Mortiſes. Of theſe there are five remaining, three of which are entire, and two ruin'd in ſome meaſure, but the Stones are ſtill upon the Spot. From the Entrance into the *Adytum* theſe Trilithons are placed two and two on each Side, and one at the upper End, which was the higheſt, as the two firſt on the Right and Left were the loweſt; but all the Stones are of a ſurprizing Magnitude. The firſt Trilithon on the Right has ſuffer'd much, its Impoſt and one of the Uprights being tumbled down, and each broken into three Pieces. The oppoſite Trilithon on the Left Hand is ſtanding, but very much decay'd; the the next to it is entire, as is likewiſe that facing it on the Right, except that one End of the Impoſt is fallen off, and its upper Part much impair'd by the Weather. The Trilithon at the upper End, which ſtood beyond the Altar, was the fineſt Part of the whole Work, the Uprights having been (according to the Doctor) above ten Yards long, well chiſſell'd, and juſtly proportion'd in their Dimenſions. One of them ſtands entire, but leans againſt one of the Stones of the inner Oval; the other is broken in two, and lies upon the Altar, as does the huge Impoſt it once ſupported. This broken Stone (the Doctor tells us) weighs above forty Tons, and would require a hundred and forty Oxen to draw it, and yet is not the heavieſt Stone neither. It is therefore amazing, not only how ſuch maſſy Loads were brought hither (as they muſt have been) from the Diſtance of fifteen or ſixteen Miles, but to ſee ſo many of them placed together in a nice and critical Figure, artfully join'd by Tenons and Mortiſes, and a geometrical Proportion obſerv'd through the whole Structure. How could they manage ſuch prodigious Stones as theſe, which they have fix'd as it were in Sockets dug in the Chalk, and ramm'd in like Poſts, without more Irregularity in their Height and Diſtance? *

THE inner Oval conſiſts of leſſer Stones, which roſe gradually in Height from the Entrance to the upper End of the *Adytum*. There are only ſix of theſe remaining upright, with the Stumps of three or four more, and ſeveral lying on the Ground.—As for the Stone which our Author takes to have been the Altar, it is of a different Kind from the reſt, reſembling the blue coarſe Marble that is brought from *Derbyſhire*, and frequently uſed for Tomb-ſtones. It is twenty Inches thick, and about twice as broad; but its Length is not eaſily aſcertain'd, being broken into ſeveral Pieces, and almoſt ſunk into the Ground by the Weight of the Ruins fallen upon it, particularly the Impoſt and one of the Uprights of the great Trilithon above-mention'd.—The Heads of Oxen, Deer, and other Beaſts, (the undoubted Reliques of Sacrifices) which have been found upon digging in and about this Place, are a Confirmation that *Stonebenge* was originally a Pagan Temple*.

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* Though the Size of many of theſe Stones is enormous enough, yet they are Trifles compared to ſome that we read of. Thoſe (for Inſtance) that were uſed in building the Battlement or additional Wall to ſupport the Precipice of *Mount Moriah*, on which the Temple was erected, were much larger than any of *Stonehenge*, each Stone being forty Cubits in Length, fourteen in Breadth, and eight in Thickneſs. Perhaps the Ancients had ſome Method of moving heavier Weights than we now find practicable.

AROUND this Temple are a great Number of *Barrows*, (as they are call'd) or Monuments of Earth thrown up in Form of a Bell, moſt of them ſurrounded with little Ditches, and ſome of them with a large circular Trench of ſixty or a hundred Cubits in Diameter. All the riſing Grounds about *Stonehenge*, for ſeveral Miles round, are cover'd with theſe Barrows; from whence ſome have concluded that great Battles have been fought upon the Plain, and that the Bodies of the Slain were there interr'd: But they are in reality no other than Family Burying-Places, and ſeveral of them the ſingle Sepulchres of Kings and eminent Perſons, which are ſituated near this Temple for the ſame Reaſon that we bury in Churchyards and conſecrated Ground; for it is obſervable, that all theſe Barrows, even thoſe at the greateſt Diſtance, are within View of *Stonehenge*.

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* Dr. *Stukely* ſuppoſes that *Stonehenge* was built not long after *Cambyſes* invaded *Egypt*, and by his Outrages forced the Prieſts and Inhabitants in general to diſperſe themſelves into all Parts of the World. Some of theſe he imagines came into *Britain*, and introduced Part of their Learning, Arts, and Religion among the *Druids*, and perhaps had a Hand in this very Fabrick, the Stones being wrought with a Tool, which he thinks was not the Cuſtom of the *Druids*, their other Works being of rude Stones, after the *Patriarchal* and *Jewiſh* Mode. At that Time the *Phœnitian* Trade was at its Height, whoſe Veſſels might convey the *Egyptians* to this Iſland; which makes our Author's Conjecture the more probable. This was before the Building of the Second Temple of *Jeruſalem*.—What might poſſibly have clear'd up theſe Uncertainties was a Tablet of Tin, with an Inſcription upon it, found at *Stonehenge* in the Reign of King *Henry* the Eighth: But as the Characters were not then underſtood by thoſe who were conſulted on that Occaſion, the Plate was deſtroy'd, or at leaſt thrown by and loſt.

IN the Year 1722 the late Lord *Pembroke* open'd a Barrow, and in the Centre of it, about three Feet under the Surface, found a perfect Skeleton, the Head lying North towards *Stonehenge*. The Year following, by his Lordſhip's Order, Dr. *Stukely* open'd another, and found an Urn of unbak'd Clay, containing a Heap of burnt Bones, intermix'd with a great many Beads of various Shapes and Colours. The Collar-Bone and one Side of the Under-Jaw remain'd very entire; from the Size of which, and from the Female Trinkets depoſited in the Urn, it appears to have been a young Woman of fourteen or fifteen Years of Age, who had carried Arms, as the *Britiſh* Virgins uſed to do, the Braſs Head of her Javelin being found amongſt the Remains. In the next Barrow to this, incloſed within the ſame Trench, was found the Skeleton of a Man, but through Length of Time the Bones were exceedingly rotten and periſh'd. In another Barrow the Doctor found all the burnt Bones of a Man, but no Signs of an Urn; and in ſome Barrows, amongſt the human Bones, were thoſe of Horſes, Dogs, and other Animals. From theſe Diſcoveries our learned Author thinks it evident, that the ancient *Britons* had the Cuſtom of burning the Bodies of their Dead before the Name of *Rome* was known.

ABOUT three Miles from *Woodſtock* in *Oxfordſhire* is a Monument of Antiquity call'd *Rollrich-Stones*, ſomething of the Nature of that we have been deſcribing, being a Circle of Stones of an irregular Figure, but not above five Foot high, ſome few excepted. Mr. *Toland* takes them to be the Remains of an old *Britiſh* Temple; others ſuppoſe they were raiſed in Memory of a Victory obtain'd by *Rollo* the *Dane*, or on Occaſion of his being proclaim'd King of *England* by his Army. That they were erected on account of the Coronation of ſome of the *Daniſh* Kings, ſeems indeed to be the moſt probable Conjecture*.

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* At a little Diſtance from this Circle of Stones there is one larger than the reſt, which the Country-People call *the King*, from a fabulous Tradition amongſt them not worth mentioning; but (as the Author of the *Addenda* to Mr. *Camden* obſerves) this may poſſibly be the *Kongſtolen* belonging to the Circles of Stones uſually raiſed for the Coronation of the Northern Kings, as *Wor-*

AMONGST the Antiquities of this Kind we may reckon *The Hurlers*, a Number of large Stones in three Circles, on a Down not far from *Bodmin* in *Cornwall.* They are oblong, rough, and unhewn; and take their Name from a ſuperſtitious Opinion of the Vulgar, that they were Men transform'd into Stones for profaning the Sabbath by *hurling* the Ball, an Exerciſe for which the People of that County are particularly famous. Some take them for Trophies erected in Memory of a Battle; others for Boundaries to diſtinguiſh Lands; and others, with more Probability, for ſepulchral Monuments: But Dr. *Stukely* will have it to have been a Temple of the Druids, as well as *Stonehenge* on *Saliſbury* Plain.

THESE Circles of Stones are frequent in *Wales*, where we likewiſe find many other Monuments of a different Kind, which may be reckon'd among thoſe unaccountable Antiquities that are beyond the Reach of Hiſtory. As a Specimen of the reſt we ſhall mention that call'd *Arthur's Stone*, upon *Kevn-bryn*, a Mountain in *Glamorganſhire*. This is a vaſt unwrought Stone, weighing about twenty Tons, ſupported by ſix or ſeven others not more than four Foot high, ſet round in a Circle. They are all of the Millſtone Kind, which is the natural Stone of the

Moun-

mius informs us; eſpecially ſince we learn from the ſame Author, that this *Kongſtolen*, though commonly placed in the Middle, was yet ſometimes at a diſtance from the Circle.

Mountain; and it is ſaid that ſeveral Tons have been broken off the great one for that Uſe. The Carriage and fixing this huge Stone upon its Supporters is plainly the Effect of human Art and Labour, which muſt have been more than we can eaſily conceive. There are ſeveral other Monuments of this Sort in *Wales*, which are generally ſuppoſed to have been Places of Burial.

IN *Hoy*, one of the *Orkney* Iſlands, there is a very remarkable Stone call'd the *Dwarf-Stone*, thirty-ſix Feet long, eighteen broad, and nine thick. It is all hollow'd within, having an Entrance on one Side about two Feet ſquare, with a Stone of the ſame Dimenſions lying near it, which undoubtedly was intended for a Door. Within, at the South End of it, there is the Form of a Bed and Pillow, big enough for two Perſons, neatly cut out of the Stone. At the North End there is another Bed or Couch, and in the Middle is a Fire-Place, with a Hole above it for a Chimney. The Marks of the Workman's Tool are very evident about it; and it is generally ſuppoſed to have been a Hermitage.

AMONGST the Antiquities of *Britain* we ought to mention the famous *Picts* Wall, which croſs'd the whole Iſland from *Newcaſtle* upon *Tyne* to the *Iriſh* Sea, above eighty Miles in Extent. It was built by the *Romans* to prevent the *Picts* and *Scots* from making their Inroads, as they frequently did, into the Southern Parts of the Iſland. The Emperor *Adrian* firſt threw up a Wall of Earth, ſtrengthen'd with large Stakes drove into the Ground and wreath'd together with Wattles. This was repair'd in the Year 123 by the Emperor *Severus*, who added to it ſeveral Stone-Turrets, near enough to give an Alarm from one to another by the Sound of a Trumpet. Having been ſeveral times deſtroy'd by the *Picts*, and repair'd by the *Romans*, at laſt *Ætius*, a *Roman* General, rebuilt it of Stone in the Year 430; but it was ſoon after ruin'd by the *Picts*, and no longer regarded but as a Boundary* between the two Nations. This Wall was eight Feet thick and twelve Feet high, and the Remains of it are ſtill to be ſeen in ſeveral Parts of *Cumberland* and *Northumberland*. The higheſt Piece of it that is now left ſtanding between *Carliſle* and *Newcaſtle* is about *Thirlewall*, where it is near three Yards high; but the far greater Part of it has been carried off to build Houſes, or to make Fences about the neighbouring Grounds; and in ſome Places whole Towns ſtand at this Time upon the very Foundation.

IRELAND is not ſo full of Antiquities as *Great-Britain*, though not deſtitute of ſuch Curioſities. About a Mile from *Caſtle-Conner* in the County of *Roſcommon* there is a round Hill, into which an Entrance was diſcover'd in 1640, and ſeveral ſquare Chambers found within it, built with large Stones, and communicating with each other by circular Paſſages.—In the Hill or rather Rock of *Corren* many ſtrange Receſſes have been form'd; and before theſe Caves there is a Path cut out of the Rock, about a hundred Paces in Length. This Work, which the Country People call the *Giant's Houſe*, is ſuppoſed to be either *Iriſh* or *Daniſh*.—An ancient Marble Sepulchre was dug up at *Dublin* in 1646, containing Coals, Aſhes, and human Bones, which is reckon'd to have belong'd to the *Danes* before their Converſion to Chriſtianity.—Urns, Altars, Trumpets, *&c.* have been diſcover'd in the County of *Tyrone* in the Province of *Ulſter*, of which an Account is given in the *Philoſophical Tranſactions*.

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* Towards the End of the laſt Century was found in the Rubbiſh of this Wall a winged Image of Braſs, about ſix Inches long, agreeing well enough with the Deſcription which ſome of the Ancients have given us of the God *Terminus*, whom they uſed to lay in the Foundations of their Boundaries.

IF the Reader would be more fully inform'd of the curious Remains of Antiquity to be ſeen in theſe Kingdoms, we refer him to *Camden* and other Authors who have profeſſedly wrote on that Subject, and proceed to give a brief Deſcription of ſome of our moſt remarkable Buildings ancient and modern.

BUILDINGS.

OF all the Churches in *England*, or even in *Europe* (if we except St. *Peter*'s at *Rome*) the moſt famous is St. *Paul*'s Cathedral in *London*; one of the moſt magnificent and beautiful Structures that any modern Age has produced, though the Effect it ought to have is much cramp'd by the great Crowd of Buildings with which it is too cloſely ſurrounded. Some indeed have cenſured it for its Heavineſs; but theſe Critics have neither made Allowance for its diſadvantageous Situation, nor conſider'd ſeparately the Beauty and Proportion of every Part, in order to enter into the Nature and Deſign of the whole Compoſition. Let this be done by any one who underſtands the Rules of Architecture, and we may venture to affirm, that St. *Paul*'s will be found no more liable to the Objection of being a heavy Pile, than St. *Peter*'s itſelf.

IT is built of fine *Portland* Stone, after the Model of St. *Peter*'s at *Rome*, having two Ranges of Pilaſters on the Outſide, one above another, beſides twenty Columns at the Eaſt, and four at the Weſt End, and thoſe of the Porticoes. There is a very handſome Aſcent to the Weſt Portico, which is ſupported by twelve Columns, and eight above them ſupport a Gallery, where there is a noble Baſs-Relief repreſenting the Hiſtory of St. *Paul*'s Converſion.

The Aſcent to the North Portico is by twelve Steps of black Marble, the Dome whereof is raiſed upon ſix Columns, over which are the Queen's Arms ſupported by two Angels, and under their Feet a Lion and an Unicorn. To the South Portico we aſcend by twenty-five Steps, and over the Door-Caſe is a Phœnix in Flames, with the Word *Reſurgam* underneath it. The Iron Baluſtrade which runs round the Church is very beautiful, the Expence of which amounted to above eleven thouſand Pounds, there being near three hundred Tons of Iron in it, which coſt Sixpence a Pound. The Pillars which ſupport the Roof and Cupola or Dome are very ſpacious, and all adorn'd with Pilaſters of the *Corinthian* and Compoſite Orders. Round the Inſide of the Cupola, where the Converſion of St. *Paul* is finely painted by the late Sir *James Thornhill*, runs a handſome Balcony or Gallery of Iron, remarkable for its Whiſpering-Place, where Words ſpoken very ſoftly, or even the ticking of a Watch, may be heard diſtinctly at the Diſtance of more than a hundred Feet. Above the Dome, on the Outſide, there is a neat gilded Balcony, and above that a Stone Lantern near ſeventy Feet high, with a Ball and gilt Croſs at the Top. The Floor of the Choir is paved with Marble, and the Altar-Piece has four beautiful Pilaſters, painted and vein'd with Gold, in Imitation of *Lapis Lazuli*.

AT the Weſt End of the Cathedral is a curious Marble Statue of the late Queen *Anne*, holding a Sceptre in one Hand and a Globe in the other, ſurrounded with four beautiful emblematical Figures, repreſenting *Great Britain*, *France*, *Ireland*, and *America*.

THE whole Expence of this magnificent Fabrick, from laying the Foundation of it to the preſent Time, is computed at above a Million Sterling. Its Length from Eaſt to Weſt, including the Portico, is 500 Feet; its Breadth, including the North and South Portico's, 311; and its Height, from the Ground to the Top of the Croſs, 344. The Height of the Turrets at the Weſt End is 208 Feet, and of the Body of the Church 120. Upon the whole we may conclude, that if Sir *Chriſtopher Wren*'s Plan had been follow'd, according to which this Cathedral was to have had an Area ſuitable to its Bigneſs, all the principal Streets to have been laid in direct Lines upon rebuilding the City after the Fire, the Houſes built uniform and placed on Piazzas, the Pariſh-Churches diſpoſed in proper Points of View, *&c.* if this had been done, St. *Paul*'s would not only have appear'd to much greater Advantage, but the Symmetry ariſing from ſo many beautiful Viſto's would perhaps have ſurpaſs'd any thing that has yet been ſeen in the World.

LET us now take a View of that ancient and venerable Pile, the Abbey-Church of St. *Peter*, *Weſtminſter*, which was fifty Years in building, and which has been the Burial-Place of moſt of the *Britiſh* Monarchs. The Form of the Church is a long Croſs, and the Choir, which has an Aſcent of ſeveral Steps to a beautiful Altar-piece, is paved with black and white Marble. The whole Length of the Abbey is about 490 Feet, the Breadth of the Weſt End 66, that of the Croſs-Iſle 189; and the Height of the Middle Roof is 92. The Pillars are of *Suſſex* Marble, and are fifty in Number, beſides near the ſame Number of Pilaſters. There are 94 Windows, of which thoſe at the four Ends of the Church are very ſpacious; which with the Roofs, Doors, Arches, *&c.* are all of the ancient *Gothic* Order. The Outſide was adorn'd with many Statues of Kings, moſt of which are now decay'd. Some Figures of the Apoſtles in *Gothic* Niches ſtill remain, and a vaſt Number of ſmall Figures in Relievo.

OF the Chapels which contain the funeral Monuments of our Kings and Nobility, that built by *Henry* VII. is particularly beautiful, at the Eaſt End of which is a large Window with fine painted Glaſs, and at the Weſt End three ſpacious Portals of ſolid Braſs, which open into the Room where the Lower Houſe of Convocation formerly ſat. The Roof, which is all of Stone, is divided into ſixteen Circles of moſt curious Workmanſhip, and ſupported by Pillars and Arches of the *Gothic* Order, enrich'd with Figures of Fruit and other Ornaments. Here are likewiſe a great many Statues in Niches, which look like Kings, Queens, *&c.* having Angels under them ſupporting Imperial Crowns; but they are commonly taken for Saints or Martyrs. In this Chapel is the Tomb of the Royal Founder and his Queen, whoſe Figures lie on it at full Length, in ſolid Braſs richly gilt; and at each Corner is an Angel in the ſame Metal. On the Sides of the Pedeſtal are two *Cupids* ſupporting the King's Arms and an Imperial Crown, an Angel treading on a Dragon, and various other Figures. The Screen or Fence round this Tomb is alſo of ſolid Braſs, adorn'd with Pillars and Arches, and enrich'd with Roſes and other Ornaments, all of excellent Workmanſhip.—But a more particular Account of this and all the other ſtately Tombs and Monuments that adorn this Abbey would much exceed the Room we can allow them here: We ſhall therefore only add, that of the modern ones the fineſt are reckon'd thoſe of the late Duke and his Mother theDucheſs of *Buckinghamſhire*, in the Chapel we have been deſcribing; and in the Abbey thoſe of the Duke of *Newcaſtle*, Sir *Iſaac Newton*, Sir *Godfrey Kneller*, Lord *Stanhope*, and Mr. Secretary *Craggs*. Beſides theſe there are a great Number, eſpecially among the Poets, that are curious Pieces of Sculpture, perform'd by the beſt Statuaries. —Perhaps ſome Perſons may think it juſt worth mentioning, that in *Edward the Confeſſor*'s Chapel are kept the two Chairs in which our Kings and Queens have been crown'd ever ſince the Time of *Edward* I, who brought hither, among other Spoils taken from the *Scots*, the famous Marble-Stone placed under one of the Chairs, on which the Kings of *Scotland* had been crown'd for many Ages.

WE now proceed to the famous *Minſter* or Cathedral of *York*, which is dedicated to St. *Peter*, built in the *Gothic* Taſte, and by ſome eſteemed the fineſt in *England*, if not ſuperior to any thing of the Kind in *Italy*; for here the Rules of Proportion have been obſerved much more than what is uſually found in other *Gothic* Structures. The Weſt Front is adorn'd with two regular Towers, bound together and ſupported by the largeſt *Gothic* Arch in *Europe*, under which is the principal Entrance into the Church. Over this Arch is a magnificent Window, as there is another at the Eaſt End, which can never be ſufficiently admired, being upwards of thirty Feet in Breadth, and ſeventy-five in Height, and beautifully painted with the Hiſtory of the Bible in a hundred and ſeventeen Partitions. The moſt remarkable Deficiency is in the Lanthorn Steeple, which terminates but indifferently; though it is finely ornamented, and has eight ſtately Windows meaſuring forty-five Feet from Top to Bottom. The Stone-Screens at the Ends of the Choir are beautifully wrought, one of which ſeparates it from the Middle of the Church, and the other terminates it behind the Altar, to which there is a graceful Aſcent of ſixteen Steps. The carved Wood-work of the Choir is very ancient, and adorn'd with a great many knotted Pinacles. The South End of the Cathedral is beautified with a circular Window, call'd the *Marigold* Window, the Glaſs being ſtain'd of that Colour; and at the North End are five Lights reaching almoſt from Top to Bottom, ſaid to have been erected at the Charge of five Maiden Siſters, which may be conſider'd as one ſtately Window, the Painting on which repreſents a rich Embroidery of *Moſaic* Needle-Work.—The Chapter-Houſe* is an octogon *Gothic* Building, ſixty-three Feet in Diameter, with Windows of painted Glaſs, and finiſh'd with an Arch or Concave about 68 Feet in Height. The Roof, which has been finely painted and carv'd, but is now much ſullied, has not a Pillar to ſupport it, but depends entirely upon one Pin, placed geometrically in the Centre. It has thirty-two Stalls round it, all of fine Marble.—In the Veſtry-Room are preſerved ſeveral Antiquities, particularly the famous Horn, ſo call'd from its Shape, but made of Ivory, by which one *Ulphus*, a *Saxon* Governor, diſinherited his two Sons, and beſtow'd his whole Eſtate on this Cathedral*. —We have only to give the Dimenſions of this magnificent Structure, which are as follow. Its Length from Eaſt to Weſt is 524 Feet; from North to South 280. The Height of the Body of the Minſter is about 100 Feet, and the Top of the Lantern without is 234 Feet from the Ground.—And we may add, that in the South Tower there is a deep Peal of twelve Bells, the Tenor of which weighs fifty-nine hundred Weight.

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* Pope *Pius* the Second is ſaid to have very much admired the Cathedral here deſcribed, extolling it *for its wonderful Magnificence and Workmanſhip, and for a lightſome Chapel, with glazed Walls united by ſlender Pillars.* This Chapel is the Chapter-Houſe, which is confeſſedly one of the neateſt Structures in *England*, having the following Line written on it in Letters of Gold:

Ut Roſa flos florum, ſic eſt Domus iſta Domorum.

The Jingle would be loſt in *Engliſh*; but it implies, that this Building excells others, as much as the Roſe does other Flowers.

HAVING done with *Weſtminſter* and *York*, we ought not to defer any longer our Deſcription of the beautiful Cathedral at *Saliſbury*, which, of a *Gothic* Structure, is certainly the moſt elegant in the Kingdom. It was begun in the Year 1219, and finiſh'd in 1258, when it was conſecrated in the Preſence of King *Henry* III, and a great Number of the Biſhops and Nobility. It coſt above 26,000*l.* which was a very large Sum for thoſe Days. The Spire, which is of Free-ſtone, ſtands in the Centre of the Cathedral, and is deſervedly admired, being the higheſt in the Kingdom, *viz.* 410 Feet from the Ground, which is twice the Height of the Monument in *London*. It is therefore ſurprizing to think, that the Walls of it, upon Examination after the great Storm in 1703, were found near the Top to be little more than four Inches thick. Since this they have been ſtrengthen'd with Bands of Iron, which perhaps may preſerve the Spire as long as the reſt of the Building. In ſhort, the Outſide of this Cathedral is truly magnificent, but the Inſide does not come up to it; for though the Carving, what little there is of it, is good, the Painting is but indifferent. It is remark'd of this fine Structure, that its Doors are equal in Number to the Months of the Year, its Windows to the Days, and its Pillars and Pilaſters to the Hours*. The latter are a Sort of fuſile or caſt Marble, the Art of making which is either quite loſt, or little underſtood. There is no Aſcent to the Choir, which ſomewhat reſembles a Theatre, being painted with golden Pannels, intermix'd with Garlands of Roſes and other Flowers, which run round the Tops of the Prebendaries Stalls. The Pillars which ſupport the Biſhop's Throne are gilt, and it is painted all over with Flowers upon White. As to the Dimenſions of this Church, the Length of it from Eaſt to Weſt, including the Buttreſſes, is 478 Feet; that of the Tranſept from North to South 210; and the Height of the Vaulting is 80.—But we muſt not forget the Chapter-houſe, which is an Octogon, no leſs than 150 Feet in Circumference, and yet the Roof has no other Support than a ſmall Marble Pillar in the Centre; ſo that it is reckon'd a Curioſity ſcarce to be match'd in *Europe*.

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* *Camden* relates, from an old Author, that "*Ulphus* "finding ſome Difference "like to happen between "his eldeſt and youngeſt "Son about the Lordſhips "after his Death, took this "Method to make them e- "qual. He ſet out for *York*, "taking along with him "the Horn he uſed to drink "out of, fill'd it with Wine, "and kneeling before the "Altar, beſtow'd upon God "and St. *Peter* all his Lands "and Tenements."—This Horn, after being kept in the Minſter till the 16th Century, was miſſing for a long time, but was recover'd by *Henry* Lord *Fairfax*, and there remains at preſent.

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* Theſe remarkable Circumſtances are ſumm'd up in the following Lines, which are a Tranſlation of ſome *Latin* ones to the ſame Purpoſe:

As many Days as in one Year there be,
So many Windows in one Church we ſee;
As many Marble Pillars there appear,
As there are Hours throughout the fleeting Year;
As many Gates as Moons one Year does view:
Strange Tale to tell, yet not more ſtrange than true.

HERE we ſhall juſt mention the Cathedral of *Lincoln*, though perhaps it ſhould naturally have follow'd that of *York*, there being a Contention between them which has the Preference in Extent, though we think it ought to be decided in favour of *York*. In Point of Situation however that of *Lincoln* has infinitely the Advantage, as it ſtands on a high Hill, which makes it conſpicuous to a vaſt Diſtance*. The Middle

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* The Monks concluded, from the Magnificence and Elevation of this Structure for Divine Worſhip, that the Devil muſt needs look upon it with an envious Eye; and hence the Proverb of a Man who has Malice and Envy in his Countenance, *He looks as the Devil over* Lincoln.

Tower is reckon'd the higheſt in the Kingdom, and had formerly a Spire, but at preſent there are only four ordinary Pinacles, one at each Corner. The Catherine-Wheel Windows are very curious, as are alſo the Chapterhouſe, Cloyſters, and Library. The Circumference of the famous great Bell here, uſually call'd *Tom of Lincoln*, is 22 Feet 8 Inches: It weighs near five Tons, and will hold 424 Gallons Ale-Meaſure.

As we are not far from *Boſton*, it is proper to take notice of its Church, which is reckon'd the largeſt Pariſh-Church without Croſs-Iſles in the whole World, being 300 Feet long within the Walls, and 100 Feet wide. Its Roof, which is handſomely cieled with *Iriſh* Oak, is ſupported by 24 tall and ſlender Pillars. The Tower or Steeple is famous for its Height and Workmanſhip, being 100 Yards high, including the octogon Lanthorn on the Top, which is admired for the Thinneſs of the Stone-Work. This extraordinary Height makes it viſible a long way on every Side, and eſpecially towards the Sea; ſo that it is a very uſeful Guide to Mariners on that dangerous Coaſt, as well as the Wonder of Travellers.—*Grantham* in this County has alſo a fine large Church, with a Spire Steeple 280 Feet high, which is generally reported to ſtand awry; but this is a vulgar Error.

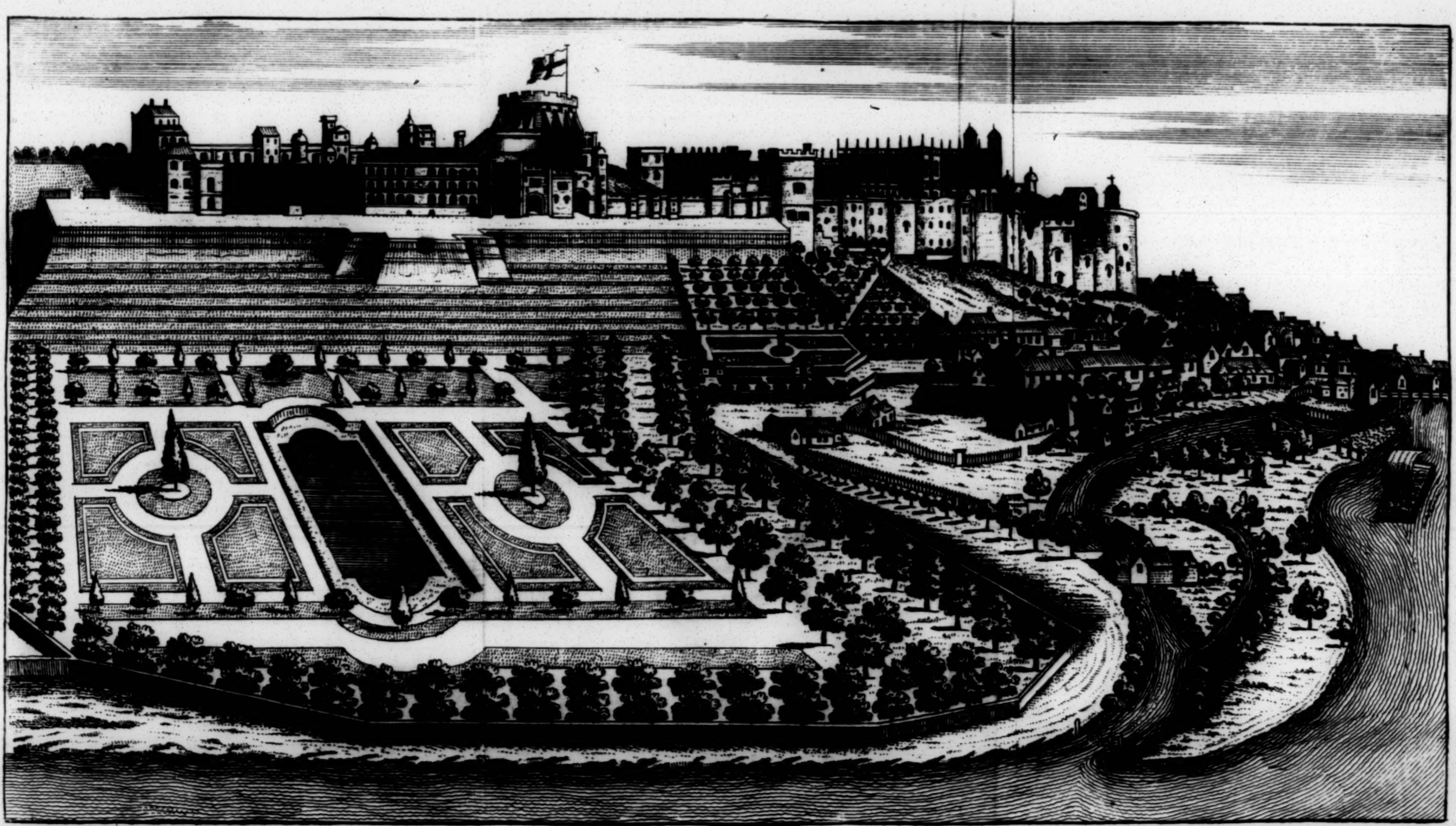
SINCE we have mention'd ſome Pariſh-Churches, we ought by no means to forget that of *Fairford* in *Glouceſterſhire*, remarkable for its twenty-eight Windows of the fineſt painted Glaſs in *England*. They contain the material Hiſtories of the *Old* and *New Teſtament*, from the Serpent's tempting *Eve*, to the Aſcenſion of our Saviour, and the Deſcent of the Holy Ghoſt in cloven Tongues. In the Weſt Window the Laſt Judgment is admirably repreſented; and in other Windows are the Figures of the Twelve Apoſtles, the four Evangeliſts, and ſome of the principal Fathers of the Church. The Whole was deſign'd by the celebrated *Albert Durer*, an *Italian*; and the Colouring in the Drapery, and ſome of the Figures, is ſo well perform'd, that *Vandyke* was of Opinion it could not be exceeded by the Pencil. This beautiful Glaſs was taken by Mr. *John Tame*, a Merchant of *London*, in a Prize-Ship bound for *Rome*; who, having purchaſed the Manor of King *Henry* VII, built this Church at *Fairford*, on purpoſe to adorn it with the Glaſs, which was buried in the Grand Rebellion, and by much Care ſince has been preſerv'd entire to this Day.

IF we look into *Scotland*, we ſhall find many ancient and magnificent Churches, which we cannot here particularly deſcribe. The *Great High Kirk* at *Edinburgh* (formerly its Cathedral) deſerves to be mention'd, which is built of hewn Stone in form of a Croſs, and ſtands in the *High-Street* in the Centre of the City. It is adorn'd with ſome Stone-Pillars and Arches, but is moſt remarkable for its lofty Tower with a large open Cupola of curious Workmanſhip, repreſenting an Imperial Crown; of which that over St. *Nicholas's* Church in *Newcaſtle* is a Model, but does not come up to it by far.

THE Cathedral at *Glaſcow* is a vaſt and ſtately Edifice, dedicated to St. *Mungo*, who was Biſhop here about the Year 560. The ſeveral Rows of Pillars, the high Towers, and the lofty Spire (the higheſt in *Scotland)* that riſes from a ſquare Tower in the Middle of the Croſs, ſhew the Skill of the Architect, and ſurprize the Beholders.

THE Church of St. *Magnus* at *Kirkwall*, in *Pomona*, the chief of the *Orkney Iſlands*, (formerly a Cathedral, but now only a Pariſh Church) is a beautiful and magnificent Structure, which in this Part of the World is the more ſurprizing. It is built of Free-ſtone, and has a fine Steeple in the Middle of it erected on four large Pillars, with fourteen others on each Side, which ſupport the Roof. Its three Gates are chequer'd with red and white poliſh'd Stones, emboſs'd and elegantly flower'd.—But it is time to have done with this Part of our Subject, on which perhaps the Reader may think we have dwelt too long already.

AFTER this Account of the ſacred Edifices that adorn our Iſland, it is proper to give a brief Deſcription of ſome of the Royal Palaces; amongſt which, whether we regard the Structure or the Pleaſantneſs of the Situation, *Windſor-*



Caſtle deſervedly claims the Pre-eminence. This Place appeared ſo charming a Spot to *William* the Conqueror, that having purchaſed it, by Exchange, of the Monks of *Weſtminſter-Abbey*, he built here a Hunting-Seat, and had ſeveral little Lodges, for the Conveniency of his Sport, in the adjoining Foreſt. It was afterwards rebuilt by *Henry* I, and in the Reign of *Richard* I. we find it look'd upon as a Place of Strength: But its preſent Magnificence is chiefly owing to *Edward* III, who enlarg'd, alter'd, and beautified it at a vaſt Expence*; not but that moſt of his Succeſſors ſeem to have taken a Pleaſure in contributing to its Grandeur.

THE Whole conſiſts of two ſquare Courts, between which ſtands the *Round Tower*, wherein are very neat Apartments for the Governor. In the Middle of the inner Square, call'd the *Higher Ward*, which is properly the Royal Palace, we ſee a fine Equeſtrian Statue of King *Charles* the Second, who took great Delight in this Place, and very much beautified the Lodgings with curious Paintings and other Ornaments. A noble Terrace-Walk*, not to be equall'd by any thing of the Kind in *Europe*, bounds the Outſide, and affords a delightful and extenſive Proſpect over the neighbouring Country. This Walk is very ſpacious on the North-Side, and is over-look'd by the Royal Apartments; thoſe of King *Edward* the Third, which were on the North-Side, being now allotted (with the reſt of the Square) to the great Officers of the Crown. The Guard-Chambers are well furniſh'd with Arms, which are curiouſly diſpoſed in great Variety of Figures; and the Cieling of one of them is finely painted, repreſenting BRITANNIA ſeated on a Globe, the *Indies* ſupplying her with Wealth, and *Europe* offering her an Imperial Diadem. Nothing can exceed the Beauty of *St. George's Hall*, at the upper End of which we ſee the Picture of King *William* on horſeback, and underneath him appears to be an Aſcent of ten Marble Steps; but when we come almoſt cloſe to them, we find the Skill of the Painter had impoſed upon us, and are agreeably ſurpriz'd at the Deception. One Side of this noble Room is adorn'd with Figures as big as the Life, repreſenting *Edward* III. receiving his triumphant Son the *Black Prince*, who preſents to his Father the Kings of *France* and *Scotland* Priſoners. At the Weſt End of the Hall is the Chapel Royal, which is finely painted with Scripture Hiſtories; and the carved Work is at leaſt equal to any in the Kingdom. In the Preſence-Chamber we ſee a *Judith* and *Holofernes*, as alſo a *Magdalen*, both finiſh'd with a maſterly Hand. In the Bedchamber the *Murder of the Innocents* is curiouſly repreſented; and the Cieling of the Cloſet is adorn'd with the Story of *Leda* and the *Swan*. In the Gallery is the fine Piece of the Daughter giving Suck to her Father in Priſon. *Duns Scotus*, who is ſaid to have kill'd himſelf by an intenſe Application to his Studies, and the *Miſer counting his Money*, are both excellent Pieces. But it would take up too much Time, as well as Room, to enumerate all the admirable Paintings and other Curioſities that adorn this Palace.

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* *William* of *Wickham* (afterwards Biſhop of *Winchester*) had the Direction of the Work; and it is ſaid he cauſed theſe Words, *This made Wickham*, to be cut in the Wall of the little Tower, which from him is call'd *Winchester* Tower to this Day: But this Inſcription, which render'd it dubious whether he made the Caſtle or the Caſtle made him, had like to have loſt him his Majeſty's Favour, till he clear'd it up by aſſuring the King, that he did not aſſume the Honour of the Work to himſelf, but only meant that the Caſtle had been the *Making of him*, by the Riches and Reputation the building of it had gain'd him.

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* This Terrace was added by Queen *Elizabeth*, who generally uſed to walk there an Hour before Dinner, if not hinder'd by windy Weather, to which ſhe had a peculiar Averſion; but ſhe lik'd well enough to walk in a calm Rain, with an Umbrella over her Head.

THE other Square, call'd the *Lower Ward*, is remarkable for the *Chapel of the Order of the Garter**, one of the moſt beautiful Pieces of ancient Workmanſhip to be ſeen in *England*. The Coats of Arms, and the various Imagery and other

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* This is a Military Order, inſtituted by King *Edward* the Third, conſiſting of twenty-ſix Knights or Companions, whereof the King of *England* is always Sovereign or Chief. Some ſay it was firſt erected in

Ornaments, not only of King *Edward* III, but of ſeveral of the firſt Knights Companions, are well finiſh'd, and have ſtood out againſt the Injury of Time to Admiration. In the Choir are Stalls for the Knights of the Order, and a Throne for the Sovereign; and in the Middle of it are alſo Stalls for the *Poor Knights* *, (as they are call'd) who live in a Sort of Hoſpital or College on the South Side of the Square.

To what has been already ſaid of this ſtately Palace I ſhall only add, that though it wants a Garden, the Beauty and Pleaſantneſs of its Parks and the neighbouring Foreſt ſeem to ſupply the Deficiency. The little Park is above three Miles round, the great one about fourteen, and the Foreſt between thirty and forty.

THE Royal Palace of *Hampton-Court*, built by the famous Cardinal *Wolſey*, deſerves to be mention'd, though it might be tedious,

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Honour of a Garter of the Counteſs of *Saliſbury*, which ſhe dropp'd in dancing, and King *Edward* pick'd up; but our beſt Antiquaries ſet this Account aſide as fabulous, and take it to have been inſtituted on occaſion of the Victory gain'd over the *French* at *Creſſy*, when that Prince (ſay ſome Hiſtorians) order'd his Garter to be diſplay'd as a Signal of Battle.

* Theſe were originally twenty-ſix in Number, and were to be Gentlemen wounded in the Wars, or impair'd by Indigence or Age. They are now reduced to eighteen, with an Allowance of 40l. a Year each; and are obliged, by their Order, to go in their Robes twice a Day to Church, to pray for the Sovereign and Knights of the Garter.

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after ſaying ſo much of *Windſor-Caſtle*, to be particular in deſcribing either the Building or its Ornaments. It is pleaſantly ſituated on the River *Thames*, nor is the Structure inferior to its Situation, having two very magnificent Fronts, and being every way fit for the Reception of a Royal Family. The Gardens are exceeding beautiful; in which Particular, but in no other, it has the Advantage of the Palace at *Windſor*. The Apartments are richly furniſh'd, and adorn'd with excellent Paintings; but of all the noble Pieces this Palace contains, none are ſo much or ſo deſervedly admired, as the *Cartoons* of the celebrated *Raphael*, which were brought into *England* by King *William*, and are not to be match'd in *Europe*. It is ſaid that *Louis* XIV. offer'd 100,000 Louis-d'Ors for them, but they are valued at 400,000 l. Sterling.—The reſt of the Royal Palaces, though beautiful enough, (eſpecially that at *Kenſington*) merit no particular Deſcription; we ſhall therefore proceed to take a View of ſome of the fine Seats of our Nobility.

WE have already obſerv'd that the Duke of *Devonſhire*'s Seat at *Chatſworth* is reckon'd one of the Wonders of the *Peak*, and it very well deſerves the Name, as it is the Aſtoniſhment of every Spectator. This magnificent Pile of Building is ſituated on the Eaſt Side of the River *Derwent*, which in calm Weather glides gently enough, but is very rapid when haſty Rains or melted Snows are pour'd into its Channel from the adjacent Mountains. From the River (which has a handſome Stone Bridge over it) we approach the Weſt Front of the Houſe by a venerable Walk of Trees. The Iron Gates and Baluſters before the Court are a noble Piece of Work, which are terminated at the Corners next the Road by two large Stone Pedeſtals, curiouſly adorn'd with Trophies of War in *Baſſo Relievo**. The Building is a Square, with a Piazza of *Doric* Columns, each of one Stone, running round the Inſide. The Bath-Room is all of Marble, very curiouſly wrought; and the Cielings and Walls of the Apartments are adorn'd with fine Paintings by *Vario* and other eminent Maſters. Scarce any thing comes up to the Beauty of the Chapel, the Altar-End and Floor being all Marble, the Seats of Cedar, and the Walls and Cieling painted by the beſt Hands.

As to the Gardens, they are full of Canals, Baſons, and Water-Works of various Forms and Contrivance; amongſt which is an artificial

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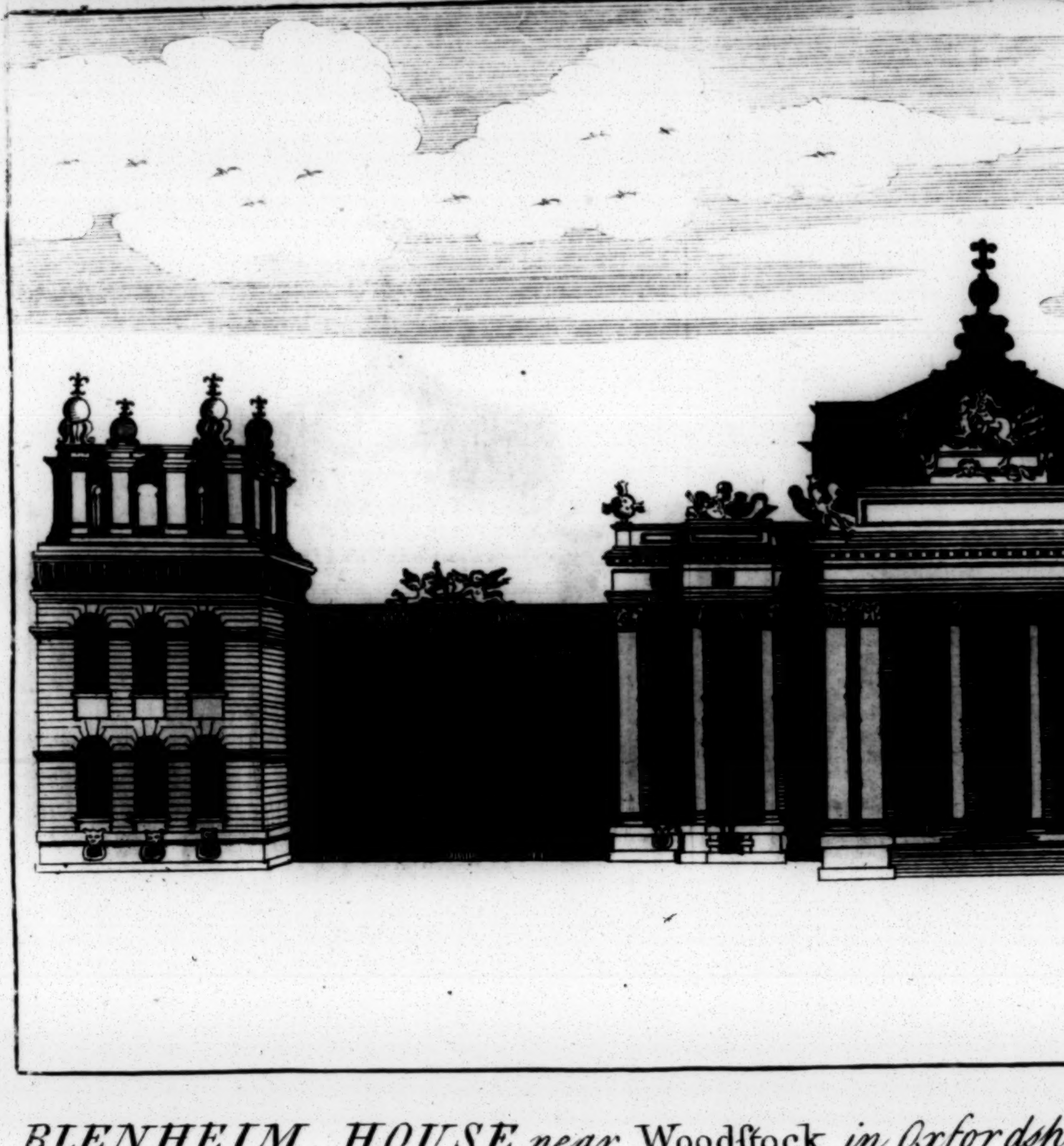
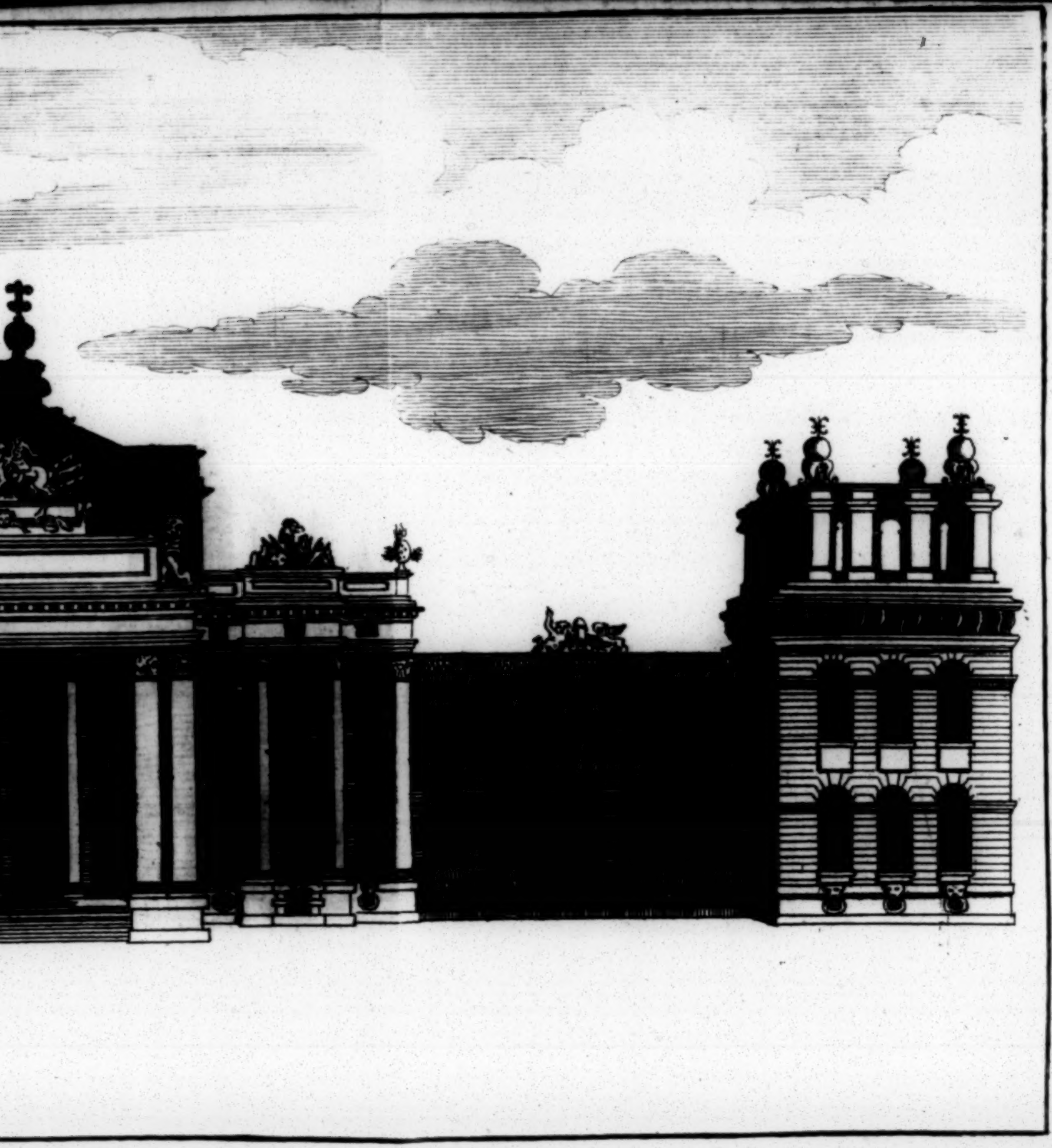
* The Term *Relievo* is applied to a Figure which projeƈts or ſtands out from the Ground or Plane whereon it is form'd. There are three Kinds of *Relievo*, call'd *alto*, *mezzo*, and *baſſo*: The firſt is when the Figure projeƈts almoſt as much as the Life; the ſecond when it ſeems cut in two, only one half of it riſing from the Plane; and the laſt when the Work is raiſed but a little from its Ground, as in Medals, Vaſes, and the Frontiſpieces of Buildings, particularly the Hiſtories, Feſtoons, Foliages, and other Ornaments of Frizes.



BLENHEIM HOUSE near Woodſtock *in Oxfordsh*



ordshire, the Seat of the late Duke of Marlborough.

cial Willow-Tree of Copper, with Water dropping from the Leaves. But the greateſt Curioſity of this Kind is a wonderful Caſcade, which, iſſuing from a neat Stone-Building, falls down a Hill a Quarter of a Mile in Length, over Steps like a Pair of Stairs, making ſuch a Noiſe and ſuch a broken Appearance as may be eaſier conceiv'd than deſcrib'd, till at laſt it ſinks under-ground and diſappears. The Green-Houſes, Summer-Houſes, Orangeries, *&c.* are very beautiful, and the Walks are embelliſh'd with fine Statues, Urns, and other proper Ornaments*.

Blenheim-Houſe, at *Woodſtock* in *Oxfordſhire*, is a vaſt and magnificent Pile of Building, deſigned to perpetuate the Memory of the ſignal Victory obtained by the Allies over the *French* and *Bavarians* near the Village of *Blenheim* on the Banks of the *Danube* †. This noble Seat together with the Manor of *Woodſtock*, was ſettled by the *Britiſh* Parliament on the Duke of *Marlborough* and his Heirs, as a grateful Acknowledgment for his Bravery and Conduct on that Occaſion. The Hall is lofty, and finely painted by Sir *James Thornhill* and others. Moſt of the Rooms are enrich'd with Marble-Chimney-Pieces, Tables, *&c.* but more by the incomparable Paintings, and eſpecially the Hangings, repreſenting the Duke's glorious Actions. Among the Pictures are ſeveral large Pieces by *Rubens*, particularly that celebrated one of himſelf, his Wife and Child. The Loves of the Gods, by *Titian*, a Preſent from the King of *Sardinia*, is a valuable Piece; and King *Charles* I. on horſeback, by *Vandyke*, is very much admired. The Gallery is exceeding beautiful, being lined with Marble Pilaſters, and the Pillars are of one Piece, ſupporting a rich and curious Entablature. Over a Pediment in the Front of the Houſe facing the Gardens is a fine Marble Buſt of *Lewis* XIV, bigger than the Life, taken from the Gate of the Citadel of *Tournay*. The Gardens are well laid out, having fine Walks,

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* It was a fine Compliment which Marſhal *Tallard* paid to the late Duke of *Devonſhire*, who had entertain'd him for a few Days at this beautiful Seat; *When I return* (ſaid he) *into my own Country, and reckon up the Days of my Captivity, I ſhall leave out thoſe I ſpent at* Chatſworth.

† It appears from a Manuſcript in the *Cotton* Library, that there was a Royal Houſe at *Woodſtock*, ſo long ago as the Time of King *Alfred*; and that King *Henry* I. was not the Founder of it, (as he is generally ſaid to be) but only rebuilt it. As for *Henry* II, who kept his fair *Roſamond* here, he made ſome Additions to it for the Entertainment and Security of his beautiful Miſtreſs: Notwithſtanding which, his jealous Queen, having got Acceſs to her in the King's

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Abſence, as Tradition ſays, diſpatch'd her by Poiſon. She was buried in a Nunnery at *Godſtow*, with this jingling *Latin* Epitaph, in which there is a *Luſus Verborum* not to be imitated in *Engliſh*.

Hic jacet in tumba Roſa mundi, non Roſa munda;
Non redolet, ſed olet, quæ redolere ſolet.
Within this Tomb lies the World's faireſt Roſe;
Tho' once moſt ſweet, ſhe'll now offend your Noſe.

Greens, Eſpaliers, &c. and the Viſto's are terminated by ſome remarkable Objects in the neighbouring Country. But of all the Curioſities about this ſtately Edifice, perhaps none are more worthy of Notice than the lofty Bridge in the Park, conſiſting of one Arch above 190 Feet wide; and the vaſt Obeliſk erected in the principal Avenue, whereon is inſcribed an excellent Summary of the Duke's Actions and Character, but too long to be here inſerted.

BUT of all the Seats of the *Britiſh* Nobility, perhaps none deſerves our Obſervation more than the Earl of *Pembroke*'s magnificent Palace (for ſo it may juſtly be call'd) at *Wilton* near *Saliſbury*, which was begun in the Reign of *Henry* VIII. on the Ruins of a ſuppreſs'd Abbey, and in that of *Edward* VI. the great Quadrangle was finiſh'd. About forty Years ago the Hall-Side was burnt down, but was rebuilt in a ſumptuous Manner by the late Earl, then Lord High Admiral of *England:* But the other Parts, rebuilt by the firſt *Philip* Earl of *Pembroke*, were the Deſign of *Inigo Jones*, and were finiſh'd in 1640. The Garden-Front in particular, which is 194 Feet long, is reckon'd one of the beſt Pieces of that celebrated Architect. In the Middle of the Platform, which is paved with Free-ſtone, there is a fine Marble-Fountain. When we enter the Houſe, on one Hand is the Hall, in which are a Marble-Shuffle-board, and two large Marble-Tables; and on the other Hand are two handſome Parlours, in the firſt of which is a fine Picture of *Chriſt* waſhing the Feet of his Apoſtles, and another repreſenting little Shepherds and Country Utenſils. Between this and the other Parlour is a Portico ſupported by two beautiful Pillars of black and ſpotted Porphyry. As to the grand Apartment, it is allow'd to be one of the nobleſt in *Europe*; and its Hall, (which is twenty Yards long, ten high, and as many broad) is adorn'd with moſt admirable Pictures by *Vandyke*, particularly a celebrated Family-Piece[*], twenty Feet long and twelve high, the Figures whereof are not only as big as the Life, but ſeem to be alive indeed[†]. Hence we aſcend the grand geometrical Stair-Caſe, the firſt of the Kind in *England*; at the Foot of which we ſee a *Grecian* Statue of *Bacchus*, of white Marble, with a young *Bacchus* upon his Shoulder eating Grapes, a Piece of excellent Sculpture. The whole Stair-Caſe, and ſome of the Rooms at the top of it, are crowded with Pictures done by the beſt *Italian* and *Flemiſh* Maſters: So is alſo another fine Stair-Caſe, at the Foot of which is a curious Marble Statue of *Flora*. The Salon, which is ten Yards ſquare, is likewiſe adorn'd with Family-Pieces, moſt of them by Sir *Peter Lilly*. In both theſe Rooms, as well as in many others, are Marble Chimney-Pieces of curious Workmanſhip, which the firſt Earl of *Pembroke* brought over from *Italy*. There are ſome of white Marble done by *Inigo Jones*, than which nothing can be more beautiful; and in one of the Garrets there is a Piece of black Marble over the Chimney, in which *Saliſbury* Cathedral and its Spire may be ſeen almoſt as plain as in a Looking-glaſs. But theſe things are Trifles compared to the noble Collection of antique Buſtoes that adorns this Place, conſiſting of the Philoſophers, Poets, Orators, *&c.* of ancient *Greece* and *Rome*; and among the Curioſities of this Kind is a Statue of the Egyptian Goddeſs *Iſis* on a Table of fine Granite. In ſhort, the Houſe is fill'd with ſuch a Number of beautiful Pieces, both of Sculpture and Painting, as would require a Volume to deſcribe; not to mention the large Heads and Horns of Stags, the Collection of Head-pieces, Coats of Mail, and other Armour for Horſe and Man*, which are Curioſities worth Obſervation.—If we look into the Gardens, which are exceeding beautiful, we ſhall find enough to admire, but perhaps nothing more than a magnificent Bridge over a River that runs through them. Here is a Grotto, the Front of which is curiouſly carv'd, and within are black Pillars of the *Ionic* Order with white Capitals, and four fine Bas-Reliefs brought from *Italy*. The Banquetting-Houſe on the Bowling-Green is very beautiful, having an *Ionic* Arcade, and at the Top of it a Row of antique Buſtoes.—We are going too far; but we hope the Reader will excuſe our having detain'd him ſo long at this majeſtic and delightful Seat, which cannot be too much admired.

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[*] It is ſaid Sir *Godfrey Kneller* would have given three thouſand Pounds for this Piece, and that the late *French* King offer'd as many Louis-d'ors for it as would cover it.

[†] They are the Earl of *Pembroke* (Lord Chamberlain of the Houſhold) and his Lady ſitting, with their five Sons ſtanding on the Right, and the Earl of *Carnarvon* and his Lady (their Daughter) on the Left; and before them ſtands their eldeſt Son and his Lady, a Daughter of the Duke of *Buckingham*.

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* The moſt remarkable Suits of Armour in this Collection are thoſe of King *Henry* VIII, *Edward* VI, and a rich Suit of an Earl of *Pembroke* named *Black Jack*, which he wore when he beſieged and took *Bologne* in *France*, where he commanded in Chief under the King. There are ſome other Suits which by the Work ſeem to have belong'd to Perſons of Diſtinction; but the reſt, about a hundred, are only for common Horſemen.

WE ſhall now give a ſhort Deſcription of the Earl of *Burlington*'s beautiful Seat at *Chiſwick*, which for Elegance of Taſte is ſaid to ſurpaſs any thing of its Kind in *England*, if not in *Europe*. In the Front of the Houſe is a neat gravell'd Court, with Yew-Hedges on each Side; and at a little Diſtance from the Houſe are two Rows of Cedars, whoſe dark and ſolemn Shade occaſions an agreeable Contraſt with the white Structure that appears between them. We aſcend to the Houſe by a noble Flight of Steps, on one Side of which is the Statue of *Inigo Jones*, and on the other that of *Palladio*, two celebrated Architects. The fluted Pillars that ſupport the Portico are of the *Corinthian* Order; and the Cornice, Frize, and Architrave are as rich as poſſible: So that this Front of the Houſe gives at once Surprize and Pleaſure to every Spectator. The other Fronts, though plainer, have a noble Boldneſs which cannot fail of pleaſing, eſpecially that towards the Gardens. As to the Inſide of the Houſe, it would take up too much Time to deſcribe its particular Beauties, every thing being perfectly well finiſh'd, the Cielings finely gilt and painted, and the Rooms fill'd with curious Pictures, done by ſome of the beſt Hands in *Europe*.

THE ſame elegant Taſte appears in the Gardens. Deſcending from the Houſe we enter on a Lawn of Graſs, planted with Ever-greens, and adorn'd with two Rows of large Stone-Vaſes. At the End next the Houſe are two Stone Wolves, and at the farther End two large Lions, which are very good Pieces of Sculpture. Three antique Statues, dug up at *Rome*, with Stone Seats between them, and a cloſe Plantation of Ever-greens behind them, terminate this Proſpect.—On the Right Hand, as we go from the Houſe, we look through an open Grove of Trees to the Orangery; and on the Left we have an eaſy Slope to a ſerpentine River, on each Side of which are Clumps of Ever-greens, and at the farther End is an Incloſure wherein we ſee an Obeliſk and a *Roman* Temple. On one Side of the River is a Wilderneſs, and on the other a handſome Building, which is an exact Model of the Portico of *Covent-Garden* Church. With the Earth and Gravel thrown up when this River was dug they have raiſed a fine Terrace, from whence we have a View of the adjacent Country, and of the Boats and Barges upon the *Thames*, which greatly enlivens the Proſpect.—We ſhall ſay nothing of the Caſcade, the Engine by which the Water is raiſed not having anſwer'd the Deſign ſo well as was expected.

Now we are ſpeaking of the Seats of our Nobility, we cannot forbear mentioning a few of the many Curioſities to be ſeen in Lord *Cobham*'s beautiful Gardens at *Stow* in *Buckinghamſhire.*—The Entrance on the South Side of the Gardens is between two ſquare Pavilions of the *Doric* Order, deſign'd by Sir *John Vanbrugh*, where immediately a ſurprizing Variety of Objects preſent themſelves to View. In the Middle of a large Octogon of Water ſtands an Obeliſk near ſeventy Feet in Height; and at a diſtance we ſee two Rivers, which join their Streams, and fall into this ſpacious Receptacle. On the Right Hand a *Gothic* Building, dedicated to *Liberty*, crowns the Summit of a Hill; and on the Left appears a Pyramid, ſixty Feet high, dedicated to the Memory of the above-mention'd Architect. Having paſs'd by three fine Statues, we come to the Cold Bath, from whence we behold a natural Caſcade, or rather three, falling from the Octogon into a large Lake; by the Side of which, in a riſing Wood, ſtands the *Hermitage*; and not far from thence the Statues of *Cain* and *Abel*, fronting a neat Structure call'd the *Veneris Hortus*, or Garden of *Venus*. From the *Belvidere*, a Building deſign'd by Mr. *Gibbs*, which is ſituated on the Top of a Mount, there is a noble Proſpect: Nor ſhould we forget the *Temple of Friendſhip*, from whence the Pavilions at the Entrance, the Caſcade, the Lake, and other Objects, afford all together a delightful Scene. This Temple is a lofty ſquare Building, of the *Doric* Order, with three fine Porticoes on the Sides that appear to the Garden. The Cieling is adorn'd with Hiſtorical Pieces, and at the Bottom of the Room are ten Pedeſtals, on which are placed the Buſts of Lord *Cobham* and his ſelect Friends. The Temple of *Ancient Virtue* is a Rotonda[*] of the *Doric* Order, by Mr. *Kent*; in which are four Niches, fill'd with the Statues of *Epaminondas*, *Lycurgus*, *Socrates*, and *Homer*, with proper Inſcriptions over each. The *Saxon* Temple is a ſolemn Grove, where the ſeven *Saxon* Deities preſiding over the ſeveral Days of the Week, are placed in Niches round an Altar; forming a Scene that ſtrikes the Mind with an agreeable Compoſure. *Bacchus*'s Temple is a Brick Building, with Paintings in the Inſide ſuitable to the Character of that Heathen Deity. St. *Augu-*

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[*] This is a popular Term in Architecture for any Building that is round within and without, whether it be a Church, a Salon, or the like. The moſt celebrated *Rotondo* of Antiquity is the *Pantheon* at *Rome*, dedicated to *Cybele* and all the Gods by *Agrippa*; but ſince conſecrated by Pope *Boniface* IV. to the Virgin *Mary* and all the Saints.

ſtine's Cave is made up of Roots of Trees and Moſs, with a Straw Couch in it, and ſtands in the Middle of a natural Wood; which Situation, with the Oddneſs of the Structure, makes an entertaining Variety. *Dido*'s Cave ſtands alſo in a Wood, but is a Stone Building. The *Pebble Alcove* is a pretty Receſs, where his Lordſhip's Arms are curiouſly done in Pebbles, and diſplay'd in proper Colours: So likewiſe is the *Sleeping Parlour*, which is a ſquare Building in a Wood, where ſix Walks center; and within it are painted the Heads of the *Cæſars*, with Feſtoons of Fruit and other Ornaments. The *Grotto* is a curious Piece of Workmanſhip; and ſo is the *Shell-Pavilion*, which is ſupported by ſix wreathed Columns. The *Chineſe* Houſe built in a Pond, is a Curioſity worth obſerving; being ingeniouſly painted on the Outſide in the *Chineſe* Taſte, and the Inſide is *Indian* Japan.

WHEN the Spectator has view'd all theſe Beauties, and many more than we can here enumerate or deſcribe, let him be conducted into the *Elyſian Fields*, and he will be charm'd beyond Imagination with the Monuments of the *Britiſh* Worthies* that adorn the delightful

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* Theſe are King *Alfred*, *Edward* Prince of *Wales*, Queen *Elizabeth*, King *William* the Third, Sir *Walter Raleigh*, Sir *Francis Bacon*, Sir *Thomas Greſham*, Sir *Francis Drake*, Sir *Iſaac Newton*, Sir *John Barnard*, (who being yet alive has no Inſcription as the reſt have) *Inigo Jones*, *Pope*, *Shakeſpear*, *Milton*, and ſome others. — What Sort of Perſons Lord *Cobham* thought worthy of a

Place. But inſtead of diſgracing theſe fine Gardens any longer with an unequal Deſcription, I ſhall conclude with obſerving, (as a late Writer has done) that Lord *Cobham* has here embelliſh'd Nature with Art, and ſupported Art by conſulting Nature, in as elegant a Taſte as perhaps was ever ſhewn in any modern or even ancient Performance of this Kind. We here find a moſt agreeable Variety of ſhady Woods and open Lawns; ſome Proſpects terminated by a well-choſen Point of View, others bounded by the Horizon alone; Walks which of themſelves create Delight, but always end with ſomething that increaſes the Pleaſure and raiſes the Admiration. The Pavilions, Pyramids, Obeliſks, Temples, Statues, Buſtoes, Monuments, Inſcriptions, are all nobly finiſh'd, and are deſign'd to inſtruct as well as to pleaſe the Beholder. In a Word, nothing is here wanting which Air, Earth, and Water, in the Hands of

Place in this *Elyſium*, is well expreſs'd in the following Lines of *Virgil*, which we read there upon a Square of black Marble, placed under a *Mercury* ſtanding in the Niche of a Pyramid:

Hic manus ob patriam pugnando vulnera paſſi,
Quique pii vates & Phœbo digna locuti,
Inventas aut qui vitam excoluere per artes,
Quique ſui memores alios fecere merendo.

Here are the Bands who for their Country bled,
And Bards whoſe pure and ſacred Verſe is read;
Thoſe who, by Arts invented, Life improv'd,
And by their Merits made their Mem'ries lov'd.

Men, can contribute to compleat a terreſtrial Paradiſe.

PERHAPS the Reader will not be diſpleaſed, if in this Place we ſhould juſt mention a few Things moſt worthy of Obſervation in our two famous Univerſities of *Oxford* and *Cambridge*; for a particular Deſcription of them would far exceed the intended Limits of our Undertaking. Beſides the Colleges and Halls in *Oxford*, ſeveral of which are large and beautiful Structures, there are ſome other publick Buildings that make a glorious Appearance. The firſt is the *Theatre*, a magnificent Fabric raiſed at the Expence of Dr. *Sheldon* Archbiſhop of *Canterbury*, under the Direction of Sir *Chriſtopher Wren*, and preſented to the Univerſity by the generous Founder for the Performance of Scholaſtic Exerciſes. The Walls round the Area, within which it ſtands, are adorn'd with ſeveral *Grecian* and *Roman* Antiquities, the greateſt Part whereof is owing to the Bounty of the Earl of *Arundel.* The Decorations in the Front of the Building are very curious and beautiful; but the Roof, which is ſupported without Beams, and finely painted, can never be ſufficiently admired.

AT the Weſt End of the Theatre ſtands the *Muſeum**, a ſtately Pile, erected at the Charge of the Univerſity, for the promoting and carrying on ſeveral Parts of curious and uſeful Learning. The lower Part of this Edifice is a Laboratory, furniſh'd with all Sorts of Furnaces and other Materials for Chymical Operations. Above this is a ſpacious Hall; and the upper Chamber is a Repoſitory of a noble Collection of natural and artificial Curioſities, moſt of them preſented to the Univerſity by *Elias Aſhmole*, Eſq; in 1683, when the Building was finiſh'd, which for that Reaſon is call'd *Muſeum Aſhmoleanum*. Very conſiderable Additions have been made to it ſince that Time; as of Hieroglyphics, and other *Egyptian* Antiquities, by Dr. *Huntington*; an entire Mummy by Mr. *Goodyear*; a large Cabinet of natural Rarities and *Roman* Antiquities by Dr. *Liſter*; a Collection of Medals by Dr. *George Clarke*, and many valuable Curioſities by other Benefactors.

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* This Name was originally uſed to ſignify a Place in the Palace of *Alexandria*, which took up at leaſt a fourth Part of the City; ſo call'd as being deſtined and ſet apart to the Muſes and the Sciences. Here were

THE *Bodleian* Library is one of the greateſt Ornaments of this Univerſity, there being few in *Europe* that exceed it in any Reſpect, and none that can boaſt of ſuch a Treaſure of Oriental Manuſcripts. The Deſign of this publick Library was firſt laid by Sir *Thomas Bodley*

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lodged and entertain'd a great Number of learned Men, who were divided into Companies or Colleges, to each of which was allotted a handſome Revenue. This Eſtabliſhment is attributed to *Ptolemy Philadelphus*, who here fix'd his Library. *Muſeum* is now become a general Denomination, being applied to any Place ſet apart as a Repoſitory of Things that have ſome immediate Relation to the Arts or the Muſes.

in the Year 1597, who repair'd the old Library of *Humphry* Duke of *Glouceſter*, and furniſh'd it with a vaſt Collection of printed Books and Manuſcripts, which he had purchaſed at a prodigious Expence from all Parts of the World. It was firſt open'd in 1602, ſince which Time it has been continually increaſing by the Benefactions of great and learned Men; particularly Sir *Rob. Cotton*, Sir *H. Savil*, Archbiſhop *Laud*, Sir *Kenelm Digby*, Mr. *Allen*, Dr. *Pocock*, Mr. *Selden*, Biſhop *Tanner*, and others. Over it is a ſpacious Gallery adorn'd with Pictures of the ſeveral Benefactors, *&c.* and with the famous Marbles* preſented to the Univerſity by the Earl of *Arundel*. Sir *T. Roe* and others have alſo enrich'd this Place with a large Collection of *Greek*, *Roman*, *Britiſh*, *Saxon*, and other Coins. Over the Porch, upon a Pedeſtal of black Marble, ſtands a fine Statue of the Earl of *Pembroke*, to whoſe Generoſity this Library is much indebted.

FOR a Repoſitory of the ſame Kind (I mean for a Publick Library) there has been lately erected at

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* On theſe Marbles are engraved in Capital Letters a Chronicle of the City of *Athens* 263 Years before the Coming of our Saviour. They were found in the Iſland of *Paros*, in the *Archipelago*, and purchaſed by *Thomas* Earl of *Arundel*, whoſe Grandſon *Henry* preſented them to the Univerſity of *Oxford*; whence they are uſually call'd *Marmora Arundeliana*, or the *Arundel Marbles*.—An Account of all theſe Inſcriptions was publiſh'd in 1676 by Dr. *Prideaux*, and ſince by Mr. *Michael Maittaire*, with a great Number of Annotations.

Oxford a lofty and magnificent Stone Building, purſuant to the Will of the celebrated Dr. *Ratcliffe*, who left 40,000 *l.* for that Purpoſe, 100 *l.* a Year for ever to furniſh it with Books, and the ſame annual Sum to keep it in Repair. This noble Benefaction, which does Honour to the Doctor's Memory, will add to the Renown of the Univerſity, and in a Courſe of Years it may probably be ſo improved as to vie with the fineſt Library in *Europe*.

NOR ſhould we forget the *Clarendon*-Printing-Houſe, none of the leaſt Ornaments of this Seat of Learning, nor perhaps to be equall'd by any thing of the Kind. It is a handſome ſtrong Building, 115 Feet in Length, beſides the ſpacious Porticoes in the North and South Fronts, which are ſupported by detach'd Columns of the *Doric* Order. The Top of it is adorn'd with the *Nine Muſes*; and amongſt them are *Homer*, *Virgil*, and *Thucydides*. It was founded in 1711, and being built partly with the Money ariſing to the Univerſity from the Copy of Lord *Clarendon*'s Hiſtory, it thence receiv'd its Name.

THUS much for the Univerſity of *Oxford*, which in point of Situation, good Air, the Number of Colleges, and the Magnificence of the Buildings in *general*, has the Advantage of *Cambridge*; though the latter may boaſt of *particular* Structures, equal at leaſt, if not ſuperior, to any in the former. *Trinity College* (for Inſtance) is a large, regular, and ſtately Pile of

Building, which in Mr. *Camden*'s Time, as he himſelf affirms, was ſcarce inferior to any in Chriſtendom: And as it has ſince receiv'd the Addition of a noble and beautiful Library, which many learned Men have with Emulation contributed to enrich, it may juſtly be placed in the firſt Rank of Colleges, and even above ſome foreign Univerſities.

King's College, though it was never compleated according to the magnificent Model firſt laid down, is nevertheleſs a very handſome Structure; but its Chapel, whether we conſider the Roof, the Carvings, or the ſtain'd Glaſs in the Windows, exceeds any thing of its Kind, and upon the whole is deſervedly admired as one of the fineſt Pieces of Architecture in the World, though it had the Diſadvantage of being carried on with great Interruptions.

St. John's College is a beautiful Building, has an excellent Library, and enjoys a pleaſant Situation. And to conclude, (ſince we have not Room to be more particular) *Clare-Hall*, which about ſixty Years ago was all rebuilt with Freeſtone, is at preſent one of the neateſt and moſt uniform Structures in the whole Univerſity.

THERE are many curious Structures in this Kingdom, of a different Kind from any yet deſcribed, ſome of which are too remarkable to be omitted. Amongſt theſe we may reckon that magnificent round Pillar of *Portland* Stone call'd the *Monument*, erected to perpetuate the Memory of the dreadful Burning of the City of *London* in the Beginning of *September* 1666. It is of the *Doric* Order, 202 Feet high from the Ground, (the Diſtance from the Spot where the Fire began) and 15 Feet in Diameter. It is fluted on the Outſide, and ſtands on a Pedeſtal 40 Feet high and 21 ſquare, adorn'd with beautiful Emblems in *Baſſo Relievo*, and Inſcriptions relating to the Calamity that was the Occaſion of its being erected. Within the Pillar is a geometrical winding Staircaſe of black Marble, conſiſting of 345 Steps, whereby we aſcend to an Iron Balcony within 30 Feet of the Top, which terminates like an Urn with a gilded Flame.

AT a little Diſtance from the *Monument* is the famous Stone-Bridge over the *Thames* to the Borough of *Southwark*, well known by the Name of *London-Bridge*, and in ſome Reſpects as remarkable as any in *Europe*, particularly for the lofty Houſes and Shops built on each Side of it, which give it ſo much the Appearance of a Street, that a Stranger ſcarce knows he is croſſing a River till he diſcovers it by two Openings near the Middle. It was erected in the room of a wooden Bridge, and finiſh'd in the Reign of King *John*, having been thirty-three Years in building, at the publick Expence. It conſiſts of twenty Arches, is 915 Feet long, and 20 wide, excluſive of the Houſes; and it is 43 Feet and a half in Height. Under ſome of the Arches at the North End of the Bridge are Machines work'd by the Tide and Ebb of the River, by which the Water is raiſed to ſuch a Height as to ſupply many Parts of the City.

IN *January* 1738-9, was laid the Foundation of another ſtately Bridge over the *Thames* from *New Palace Yard*, *Weſtminſter*, to *Stangate* on the oppoſite Shore, which this Year (1748) is like to be compleatly finiſh'd. As it is intended for a free Bridge, the Expence of it has been defray'd by ſeveral Lotteries, and other Sums granted by Act of Parliament by way of Supply for that Purpoſe. It is a noble Fabric of Stone, conſiſting of fifteen ſemicircular Arches, the middle one being 76 Feet wide, and the reſt on each Hand decreaſing gradually. The whole Length of the Bridge is 1223 Feet, beſides the Abutments at each End; and its Breadth is 44 Feet, ſo that three Carriages and two Horſemen may paſs over it a-breaſt without interrupting Foot-Paſſengers, who have a Way on each Side ſeven Feet wide, and raiſed about twelve Inches. The Baluſters at Top are exceeding beautiful; and upon the whole we may venture to reckon this Bridge among the moſt magnificent that the modern Ages have produced.

HAVING ſaid enough, or perhaps too much, upon this Head, it remains that we give ſome Account of thoſe Arts, Manufactures, &c. of the *Britiſh* Nation for which they are moſt famous, and which are the chief Source of their Power and Riches.

ARTS, MANUFACTURES, &c.

THE *Woollen Manufacture*, which includes all the Sorts of Commodities into which Wool is wrought, now makes the principal Article both in our foreign and domeſtic Trade, and therefore deſervedly comes firſt under our Conſideration. The Wools of *England* have always been in the higheſt Repute, the beſt of which are thoſe of *Leominſter*, *Cotſwold*, *Lincolnſhire*, and the Iſle of *Wight*; and though the *Scotch* and *Iriſh* Wools are commonly ſold abroad for *Engliſh*, yet they are far ſhort of it in Fineneſs*. Even the *Spaniſh* Wool, which bears a great Price amongſt us, owes its Goodneſs to a few *Engliſh* Sheep ſent over into *Spain* as a Preſent by one of our Kings. Anciently the principal Commerce of this Nation conſiſted in Wool unmanufactur'd, which was bought of us by Foreigners; inſomuch that the Cuſtoms of *Engliſh* Wool exported, in the Reign of *Edward* the Third, amounted, at fifty Shillings a Pack, to 250,000 *l. per Annum*, which in thoſe Days was a prodigious Sum. When our Wool was ſold in the Fleece, our chief Cuſtomers were the *Flemings* and *Brabanters*, particularly the Merchants of *Ghent* and *Louvain*, who took off vaſt Quantities to ſupply two Manufactories that had flouriſh'd in thoſe Cities from the tenth Century, and furniſh'd the greateſt Part of *Europe* with woollen Cloths, *&c.* But the Inhabitants of *Ghent* having divers times revolted againſt their Sovereigns, on account of certain Taxes which they refus'd to pay, the Seditious were at length puniſh'd and diſperſed, part of them retiring to *Holland*, and the reſt to *Louvain*. Theſe laſt, together with their Art, carrying with them their Spirit of Sedition, it was not long before ſeveral of them, for murdering ſome of the Magiſtrates, were obliged to fly into *England*, where they inſtructed our People how to manufacture their own Wool; in which they ſucceeded ſo well, and were ſo ſenſible of the Advantages ariſing from it, that our Parliaments have ſince that Time uſed their utmoſt Endeavours to prevent the Exportation of Wool; though all the Laws hitherto made for that Purpoſe have not put an effectual Stop to that pernicious Practice. This Eſtabliſhment of the Woollen Manufactures in *England* was about the Year 1420; though M. *de Thou* places it in the Reign of Queen *Elizabeth*, when the Troubles about Religion, and the Severity of the Duke of *Alva*, drove great Numbers of Weavers and other Artiſts out of the *Low Countries* into this Kingdom. But what that excellent Hiſtorian ſays upon this Head is rather to be underſtood of their Perfection than their firſt Eſtabliſhment, and of the ſeveral great Manufactures then ſet up at *Norwich*, *Colcheſter*, and other Places; for Hiſtory makes mention of thoſe of *London* long before any Part of the Seventeen Provinces had attempted to throw off the *Spaniſh* Yoke. How valuable the Woollen Manufacture is to this Nation appears from a Computation of Dr. *Davenant*, (and we hope it is ſince improved) who reckons the Produce thereof to be eight Millions *per Annum*, three Fourths of which are conſumed at home, and the reſt exported.

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* The Fineneſs and Plenty of our Wool is owing in ſome meaſure to the ſweet ſhort Graſs in many of our Paſtures and Downs; and the Advantage of our Sheep feeding on this Graſs all the Year, without being ſhut up in Folds during the Winter, or to ſecure them from Wolves at other Times, contributes not a little to the Softneſs of their Fleeces. M. *Colbert*, to whom the *French* Manufactures and Commerce are very much indebted, had Thoughts of procuring ſome *Engliſh* Sheep, and propagating them in *France*, by chuſing them (as near as poſſible) ſuch Paſtures and ſuch a Sky as they had in their own Iſland; ſo that the *French* might be no longer obliged to depend precariouſly on the clandeſtine Supplies of Wool from *England:* But the Count *de Cominges*, then Ambaſſador of *France* at the *Engliſh* Court, laid the Impoſſibility of getting ſuch an Export of Sheep, and of making them multiply in *France*, ſo ſtrongly before him, that he abandon'd the Deſign.

As to the Art of *Weaving*, which is now brought to ſuch great Perfection amongſt us in all its various Branches, it is undoubtedly very ancient; though it be difficult to ſay, with any Aſſurance, to whom we owe this admirable Invention, unleſs we chuſe to aſcribe it to the Spider, that ingenious little Inſect, which ſpins a moſt delicate Web out of its own Bowels. Some have fix'd the Origin of this Art as early as the Reign of *Nimrod*; and the Conjecture ſeems not improbable, ſince we read, in a ſhort Time after, of the *Babyloniſh* Garment of curious Workmanſhip. Be this as it may, we are certain that *Egypt* was anciently famous for its Manufacture of fine Linen, which was the Wealth of the Country, the chief Employ of its Inhabitants. From *Egypt* the Art was probably carried into *India* and *China*, where the *Europeans* found it in a moſt flouriſhing Condition. The *Egyptian* and *Tyrian* Merchants exported their rich Manufactures of Silk, Linen, and Cotton, into *Greece*, *Italy*, and other Countries; and the Art of Weaving ſpread itſelf with their Colonies as far as *Carthage*, and from thence into ſeveral Parts of *Europe*. The *Italians* in particular ſoon began to import unwrought Silk from the *Caſpian* Sea, and to weave it at home; and at length found Means to bring over the Worms themſelves, and the Mulberry-Trees on which thoſe Inſects feed. Thus this curious Manufacture became eſtabliſh'd in *Italy*, from whence all *Europe* was ſupplied with Silks for many Ages. After the *Italians*, the *French* carried this Art to wonderful Perfection; and we muſt acknowledge it is owing to ſome of the beſt Artiſts of *France*, who left their Country in the Reign of *Lewis* XIV. on account of Religion, that our *Engliſh* Silk-Weaving is advanced to its preſent Reputation.

THE Looms uſed by Weavers are of various Structures, accommodated to the different Materials to be wove, and to the different Manner of weaving them. As many of them are exceedingly complex, it is ſcarce poſſible to give the Reader a juſt Idea of them by a verbal Deſcription, which therefore we ſhall not attempt. But perhaps there is no Kind of Loom of a more curious Structure than that for weaving Stockings, which is a modern Invention, the Honour whereof has been greatly conteſted between the *French* and *Engliſh*. The Truth however, ſetting aſide all national Prejudices, ſeems to be, that this uſeful and ſurprizing Machine was firſt invented by a *Frenchman*, who, finding ſome Difficulty to procure an excluſive Privilege to ſettle himſelf at *Paris*, came over to *England*, where he was encouraged according to his Merit. Having imparted his Invention to the *Engliſh*, they became ſo jealous of it, that it was forbid, under Pain of Death, to carry any of the Machines out of the Iſland, or to communicate a Model of it to Foreigners: But as we firſt receiv'd it from a *Frenchman*, ſo a *Frenchman* firſt carried it abroad, and, by a wonderful Strength of Memory and Imagination, made a Loom at *Paris*, on the Idea he had form'd thereof by viewing it in *England*. This Loom was ſet up in the Year 1656, and has ſerv'd for the Model of all thoſe ſince erected in *France*, *Holland*, and other Parts of *Europe*.

THE Mention of theſe curious Machines puts us in mind of one of an extraordinary Nature, the only one of the Kind in the *Britiſh* Dominions, *viz.* the famous Engine for making Thrown Silk at *Derby*, the Model of which Sir *Thomas Lombe* brought from *Italy*, and at a great Expence erected on the River *Derwent*. This Engine contains 26,586 Wheels, and 97,746 Movements, to all which one Water-Wheel gives Motion; and every time this Wheel goes round, no leſs than 73,726 Yards of Silk-Thread are twiſted, amounting to 318,504,960 Yards in twenty-four Hours. One Fire-Engine conveys warm Air to every Part of the Machine, and the whole Work is govern'd by one Regulator.—In the 5th of King *George* I. a Patent paſs'd to ſecure to Sir *Thomas Lombe* the ſole Property of this Invention for fourteen Years: But the Undertaking being very expenſive, and the ſaid Term being near elapſed without any great Benefit ariſing to the Proprietor, Sir *Thomas* applied to Parliament, who, to preſerve the Art from being loſt, granted him 14,000 *l.* on Condition that an exact Model ſhould be taken of this wonderful Piece of Machinery; which was done accordingly, and may be ſeen in the Tower of *London.*

As the *Engliſh* have long been famous for their Skill in Navigation, as well as for their Naval Power, it ſeems proper to ſay ſomething upon this Subject. The Invention of Ships is very ancient, and at the ſame time very uncertain; ſome aſcribing it to *Dædalus*, whoſe Wings (ſay they) which he invented to eſcape withal from the Labyrinth of *Crete* were nothing but

Sails, which he added to his Veſſel, and thereby eluded the Purſuit of *Minos.* Others give the Honour of it to *Janus*, upon the Authority of ſome *Greek* and *Latin* Coins, on one Side whereof is repreſented his double Face, and on the Reverſe a Ship. But, waving theſe Uncertainties, ſome chuſe to refer the Origin of ſo uſeful an Invention to God himſelf, who gave the firſt Specimen thereof in the Ark built by *Noah* under his Direction. Hiſtory however repreſents the *Tyrians* as the firſt Navigators, who being furniſh'd from *Lebanon* and other adjacent Mountains with excellent Wood for Ship-Building, ſoon became Maſters of a numerous Fleet, by which they arrived to an incredible Pitch of Power and Riches: And it is from the ſame Source, I mean that of Navigation and Commerce, that *England* derives its Opulence and Strength, and is become the Envy of its Neighbours on the Continent.—To give the Reader an Idea of the ſeveral Parts and Members of a Ship, both internal and external, would be impoſſible without Draughts thereof, and Explanations annex'd; but he may form a Notion of the ſurprizing Bulk of ſome of theſe floating Structures, by the Dimenſions of one of the largeſt that the modern Ages have produced*, I mean one of our Firſt-Rate

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* We read of ſome Ships built by the Ancients (which indeed were more for Shew than Uſe) whoſe Magnitude far exceeded the largeſt of the preſent Times. That of *Ptolemy Philopater* was 280 Cubits long, 38 broad, and

Men of War, which is 210 Feet in Length, draws 22 Feet Water, carries 110 Guns and 1250 Men, has an Anchor weighing above four Tons, a Cable 200 Yards long, and 22 Inches in Diameter.

THE Art of Navigation was not brought to Perfection till after the Invention of the *Mariner's Compaſs*, the Honour of which is claim'd by ſeveral Nations. This is an Inſtrument by which Pilots direct the Courſe of their Ships, conſiſting of a Box including a magnetical Needle that always points nearly to the North. In the Middle of the Box is fix'd a perpendicular Pivot, which ſuſtains a Card or Paſt-board, on whoſe upper Surface are deſcribed ſeveral concentric Circles, the outermoſt whereof is divided into 360 Degrees, and the other into 32 Points anſwering to ſo many Winds, for which the Seamen have different Names. In the Centre of this Card is a Braſs Cone or Cap, a little concave, which is fitted to the Middle of the

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48 high; carrying 400 Rowers, the ſame Number of Sailors, and 3000 Soldiers. But that which *Hiero* built, under the Direction of *Archimedes*, is ſtill more extraordinary, having Wood enough in it to make fifty Galleys. It had all the Variety of Apartments contain'd in a Palace, beſides Galleries, Gardens, Baths, Fiſh-Ponds, Mills, Stables, &c. It was encompaſs'd with an Iron Rampart, and had eight Towers with Walls and Bulwarks furniſh'd with Machines of War, particularly one that threw a Stone of three hundred Weight, or a Dart twelve Cubits long, to the Diſtance of half a Mile —See more in *Athenæus* Lib. V.

Needle, and plays freely on the Pivot. It is cover'd with a Glaſs, and the Whole is incloſed in another Box, where it is ſuſpended in ſuch a Manner as to keep the Needle horizontal. The Needle is made of a thin Plate of Steel, in the Form of a Lozenge, (or what is vulgarly call'd a Diamond) and being rubb'd on a good Loadſtone acquires the above-mention'd Property of turning towards the North; the exceeding Uſefulneſs of which in Navigation is very eaſy to conceive.

THE Power of the Magnet or Loadſtone to *attract* Iron was known to the Ancients, and is mention'd by *Plato*, *Ariſtotle*, and *Pliny*; but the Knowledge of its *directive* Power, whereby it diſpoſes its Poles along the Meridian of every Place, and cauſes Needles, Pieces of Iron, &c. touch'd with it to point nearly North and South, is of a much later Date; though the exact Time of the Diſcovery, and the Perſon that made it, are yet unknown. *Guyot de Provins*, an old *French* Poet, who lived in the twelfth Century, ſeems plainly enough to hint at the Uſe of the magnetic Needle; and the *French* lay Claim to the Invention of the Compaſs from the *Fleur-de lis*, with which all Nations diſtinguiſh the North Point upon the Card. With equal Reaſon Dr. *Wallis* aſcribes it to the *Engliſh*, from its Name *Compaſs*, whereby moſt Nations call it, and which (he obſerves) is uſed in ſeveral Parts of *England* to ſignify a Circle: But if the *Engliſh* are not intitled to the Honour of the Diſcovery, they have at leaſt the Merit of having brought it to Perfection by the Method of ſuſpending the Box which contains the Needle. Some will have it, that *Marco Paolo*, a *Venetian*, having made a Journey to *China*, brought back the Invention with him in the Year 1260; and what ſeems to confirm the Conjecture is, that at firſt the *Europeans* uſed the Compaſs in the ſame Manner as the *Chineſe* ſtill do, *i. e.* they let it float ~~on~~ a Piece of Cork, inſtead of ſuſpending it on a Pivot. There is ſome Reaſon to think that our Countryman, *Roger Bacon* *, either diſcover'd, or at leaſt knew of, the *directive* Quality of the Loadſtone: But after all, *Flavio Gioia* is the Perſon who is uſually ſuppoſed to have conſtructed the firſt Mariner's Compaſs, about the Year 1300, at *Melfi* in the Kingdom of *Naples*.

THE *Variation* or *Declination* of the magnetic Needle from the true North Point, either towards the Eaſt or Weſt, which is greater or leſs in different Parts of the World, was firſt diſcover'd in the Year 1500 by *Sebaſtian Cabot*, a *Venetian*.

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* It appears that this famous Friar underſtood how to make Gunpowder above a hundred Years before we have any Account of its being uſed in the Art of War; for he expreſsly mentions the Compoſition in a Treatiſe *de Nullitate Magiæ*, publiſh'd at *Oxford* in 1216. "You may raiſe Thunder "and Lightning (ſays he) at "pleaſure, by only taking "Sulphur, Nitre, and Char"coal, which being mix'd "together, and confin'd in "a cloſe Place, cauſes a "Noiſe and Exploſion "greater than that of "Thunder."

The *Inclination* or *Dipping* of the Needle, when hung ſo as to play vertically, to a Point beneath the Horizon, was the Diſcovery of Mr. *Robert Norman*, an *Engliſhman*, about the Year 1576. The *Variation of the Variation*, that is, a Difference in the Declination of the Needle at different Times in the ſame Place, was firſt found out by another of our Countrymen, Mr. *Gellibrand*, about the Year 1634; though ſome aſcribe the Diſcovery to *Gaſſendus*. It is very difficult to account for theſe ſurprizing Phænomena; but thoſe who are deſirous of farther Satisfaction with reſpect to the Variations of the Needle we refer to the ingenious Hypotheſis of the learned Dr. *Halley*, publiſh'd in the *Philoſophical Tranſactions*.

BEFORE we take Leave of our Iſland, let us give a brief Account of its principal Fiſheries, which make a conſiderable Branch of the *Britiſh* Commerce. A great Number of Veſſels and Seamen are employ'd therein; and beſides what is conſumed at home, above 200,000*l.* Sterling is yearly return'd in Time of Peace merely for Herring and Cod exported to *Spain*, *Italy*, and ſeveral Parts of the *Mediterranean*. Notwithſtanding this, we are juſtly reproached with being too remiſs in this profitable Article of Trade, and letting our Neighbours reap the Advantage of thoſe Bleſſings which Nature ſeems to invite us to receive. The *Dutch*, *Hamburghers*, and others, come annually in Swarms to our Coaſts, where they take immenſe Quantities of Fiſh, and even ſell them to us afterwards for ready Money. *Scotland* ſuffers incredibly by this Neglect; for no Country in *Europe* can rival it in the Abundance of fine Fiſh wherewith its Seas and Rivers are ſtored; and the *Scottiſh* Iſlands, eſpecially thoſe on the Weſtern Side, lie very commodiouſly for carrying on the Fiſhing Trade to Perfection*.

WE ſhall ſay nothing of our *Cod-Fiſhery* at home, it being inconſiderable compared with that of *Newfoundland*, which ſhall be ſpoken of in its proper Place. The *Herring-Fiſhery* on the Coaſts of *Scotland*, if purſued with that Application it deſerves, would be of vaſt Advantage to *Great-Britain*. The Iſles of *Shetland* are particularly remarkable for the innumerable Shoals of Herrings that appear there in the Summer Seaſon, inſomuch that the *Dutch* ſend thither annually two thouſand Veſſels, and ſometimes more, which are employ'd in that Fiſhery during the Months of *June*, *July*, and *Auguſt*. Theſe Veſſels are a Kind of Barks call'd *Buſſes*, from forty-five to ſixty Tons, carrying two or three ſmall Cannons. During this Seaſon the Iſlanders enrich themſelves by ſelling ſeveral Sorts of *Scots* Manufactures to the *Dutch* Seamen, as well as Proviſions; and alſo by taking great Quantities of Fiſh on their own Accounts, which are purchaſed by the *Dutch*.

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* The Eſtabliſhment of a Fiſhery in theſe Iſlands was firſt attempted by King *Charles* I, in Conjunction with a Company of Merchants; but the unhappy Civil War breaking out amongſt us, the Deſign miſcarried. The next Attempt was made by King *Charles* II, who alſo join'd with ſome Merchants, and for a time the Undertaking ſucceeded well enough; but the King being in Want of Money withdrew what he had employ'd in the Fiſhery, at which the Merchants being diſguſted did the like, and ſo the Affair was ruin'd.—The Herrings about the Weſtern Iſles are reckon'd the beſt and fatteſt, though not ſo large as thoſe taken on the Eaſtern and Northern Coaſts.

THE *Hollanders* firſt began a regular Herring-Fiſhery about the Year 1164, and obſerved the ſeveral Seaſons of their Paſſage; for theſe Fiſh make a yearly Progreſs in vaſt Multitudes from the North Sea down the *Britiſh* Channel, and return again at a certain Time, obſerving a wonderful Policy and Exactneſs. They uſually go in Shoals, and are fond of following Fire or Light; and in their Paſſage reſemble a Kind of Lightning themſelves. But though the *Dutch* began their Herring-Fiſhery ſo early, the Method of ſalting and barrelling them was not diſcover'd till the latter End of the fourteenth or Beginning of the fifteenth Century*. The white or pickled Herrings cured by the *Dutch* are in the greateſt Repute, and next to them the *Iriſh*, particularly thoſe of *Dublin*, which are ſcarce inferior to the beſt Herring of *Enchuyſen* or *Rotterdam*. The *Scotch* Herring is not ſo well gutted, ſalted, or barrell'd as the *Dutch*, and yet its Taſte is excellent; nor is it doubted, but that if the *Scots* were as careful in theſe Circumſtances as their Neighbours, their Herring would be the beſt in the World.

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* *Willoughby* obſerves, that one *Buckelſz*, or *Buchalen*, a Native of *Bier Vliet*, render'd his Name immortal by diſcovering the Method of curing and pickling Herrings; and adds, that the Emperor *Charles* V, when he was in the *Low-Countries*, made a Journey with the Queen of *Hungary* to the Iſle of *Bier Vliet*, on purpoſe to view a Monument erected there to his Memory.

For Red Herrings the Town of *Great Yarmouth* in *Norfolk* has long been famous*, and indeed has engroſs'd the whole Herring-Fiſhery on the Eaſt Coaſt of *England*. The Seaſon for this Fiſhery is in *September*; and it is ſaid that fifty thouſand Barrels, (ſome ſay forty thouſand Laſts) containing no leſs than forty Millions of Herrings, are annually taken and cured here, great Part of which are exported to *Italy*, *Spain*, and *Portugal*. When the Fiſh are caught, they gut and lay them in Brine for twenty-four Hours; after which they hang them by the Head on little wooden Spits, in a Kind of Chimney made for that Purpoſe, which will hold ten or twelve thouſand at a time; where they remain till they are ſufficiently ſmoak'd and dried by a ſmothering Fire of Bruſh-Wood, and are then taken down and barrell'd up for keeping.

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* The Author of the Additions to Mr. *Camden* informs us, that this Town is bound by its Charter to ſend to the Sheriffs of *Norwich* every Year a hundred Herrings baked in twenty-four Paſties, which are to be deliver'd to the Lord of the Manor of *Eaſt Carlton* in the ſame County, who is to give a Receipt for them, and convey them to the King.

THE *Pilchard Fiſhery* on the Coaſt of *Cornwall* and *Devonſhire* is ſo profitable an Article to the Inhabitants of thoſe Counties, that it deſerves to be mention'd. This Fiſh is bigger than the Anchovy, but leſs than the Herring, which in other Reſpects it pretty much reſembles. The Seaſon for catching the Pilchards is from *June* to *September*, at which Time they appear in ſuch prodigious Shoals, that half a Million have been taken at a Draught. Many thouſand Barrels are yearly exported by the Merchants; but our Fiſh, though bigger, are not ſo much valued as thoſe taken on the Coaſts of *France*, which is principally owing to their not being ſo thoroughly cured.

THE *Salmon Fiſhery* is very conſiderable in ſeveral Places along the Coaſts of *England*, *Scotland*, and *Ireland*; but *Scotland* ſeems to have far the greateſt Share in this Branch of Commerce. Moſt of the Rivers of that Kingdom abound with Salmon, which are taken at certain Seaſons in ſurprizing Numbers, and being pickled are not only ſent to divers Parts of *England*, but exported to *Holland*, *France*, *Spain*, and other Countries. The greateſt Part of what is ſold in *London* by the Name of *Newcaſtle* Salmon is brought from *Berwick* upon *Tweed*, in which River vaſt Quantities are taken: But the Fiſhery at *Aberdeen*, in the Rivers *Dee* and *Don*, exceeds any other in *Scotland*, and their

Salmon are reckon'd the beſt in *Europe*, which perhaps are owing to their being well cured, of which the Magiſtrates take particular Care. We may judge what Plenty of theſe fine Fiſh reſort from the Sea to the Rivers juſt mention'd, where it is no uncommon Thing to take above a hundred and fifty Head of Salmon at a ſingle Draught of a Net.—We now proceed to the Continent, and ſhall begin with *France*, from which we are ſeparated only by a narrow Channel.

CHAP. II.

Of FRANCE, *including* LORRAIN, ALSACE, *&c.*

SPRINGS, CAVES, *&c.*

THE Natural Hiſtory of *France* can ſcarce afford us a greater Curioſity than the *Salt-Water Springs* at *Salins* in the *Franche-Comté*, or *County of Burgundy*; and we the rather begin with this Article, becauſe we have not taken notice of the Salt Springs in *England*, though ſeveral of them are very conſiderable. The chief Springs at *Salins* are in the Middle of the Town, in ſeveral ſubterraneous Caves or Vaults, of a great Depth and Extent. To view them we deſcend by forty Steps of Stone, and twenty of Wood, into a Vault near fifty Feet long and thirty broad, where the Noiſe of the Waters and the Engines at work to raiſe them is very ſurprizing. In this Cave we ſee (by the Light of Torches) ſix Springs of ſalt Water, and two of freſh, guſhing out of the ſame Rock within the Space of five Yards; and to prevent the Waters mixing together, there are ſeveral Channels made to convey them into different Wells or Baſons. From hence we go into other Vaults, where the double Arches reſt on very thick Pillars; and in the Middle of one of theſe is a large Baſon, into which the Waters of the Salt Springs are gather'd. Of theſe there are ſix or ſeven others, beſides thoſe already mention'd, and ten or twelve of freſh Water; all which, as before obſerv'd, run into different Baſons prepared for that Purpoſe; and from hence they are raiſed by various Engines, the freſh to be convey'd to the River, and the ſalt into large Reſervoirs, one of which holds above fifteen thouſand Hogſheads. From theſe Reſervoirs the Water is drawn off into ſmaller ones, which ſurround the Places where it is boil'd to make Salt. For this Purpoſe they have ſeveral Furnaces, over which are fix'd huge Iron Pans or Boilers, near thirty Feet in Diameter and fifteen Inches deep, containing forty-five or fifty Hogſheads. A very ſtrong Fire being made underneath, and gradually ſlacken'd, the Water is boil'd about twelve

Hours, in which it evaporates, and leaves the Salt at the Bottom of the Pan almoſt perfectly dry. Then with a Sort of Rake they take off the uppermoſt Part of the Salt, which is the moſt valuable, being whiteſt and ſtrongeſt; and the reſt is form'd into Cakes or Loaves, which when dried are fit for Uſe.

THE Place where theſe Springs lie, and all the Works neceſſary for making Salt, is ſurrounded with a ſtrong Wall, flanked with Towers and crown'd with a Parapet, ſo that it has the Appearance of a Fortification. Round the Inſide of the Wall are various Buildings, ſome of which contain the Engines that raiſe the Waters, others the Furnaces and Kettles, and in others the Salt is framed and dried. Some again are fill'd with Caſks, Tubs, and other Utenſils, both for the Uſe of the Workmen and ſending the Salt abroad; others ſerve as Warehouſes; and in others are kept great Quantities of Iron, and alſo the Coals neceſſary for ſeveral Forges which are continually employ'd in making new Boilers or mending old ones, the Violence of the Fire wearing them out in a little Time*. The whole Space thus incloſed is almoſt three hundred Yards in Length, and a hundred in Breadth.

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* The Pans or Boilers are not ſo much worn out by the Fire, as by the corroding of the Brine; and therefore the Pans at *Droitwich* in *Worceſterſhire* are made of Lead, and not of Iron, as they are in *Cheſhire* and other Places.

THESE Springs (it is obſerv'd) are not all of an equal Saltneſs, nor at all Times, for they are found to produce more Salt after heavy Rains than in a dry Seaſon*. To know the different Degrees of Saltneſs of the ſeveral Springs, they make uſe of a Tube ſomewhat more than an Inch in Diameter, and eight Inches deep, which being fill'd with the ſalt Water, they put into it a Stick, at the Bottom whereof is ſome Quickſilver to keep it upright; and this ſinks more or leſs in the Water, according as it is leſs or more impregnated with Salt. This Stick having ſeveral Diviſions mark'd upon it, ſhews what Quantity of Salt a certain Weight of Water will produce; and accordingly they take care to add ſuch a Proportion of the ſtrongeſt Water to the weakeſt, as may anſwer the End of boiling it; for if the Water be too weak, that is, if a hundred Pound Weight of it will not yield at leaſt eighteen or twenty Pounds of Salt, the Profit will not anſwer the Expence.

NEAR *Bourbon-Lanci* in the Duchy of *Burgundy* there is a mineral Spring which is very remarkable, if all be true that is related of its Properties. It is ſaid to be ſo hot that a Man cannot keep his Hand in it two Minutes, and yet an Egg left in it a whole Hour will not grow hard. It has neither Smell nor Taſte; nor does it burn the Lips when drank, or add any Warmth to the Stomach.

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* According to Dr. *Jackſon*'s Account of our Salt Springs at *Nantwich* in *Cheſhire*, the Workmen there obſerve quite the Reverſe, *viz.* that more Salt is produced from the ſame Quantity of Brine in dry than in wet Seaſons.

THE *Burning Spring*, which is reckon'd one of the Wonders of *Dauphiné*, is in reality no Spring at all, but a Spot of Ground about two Yards in Length and one in Breadth, on which there appears a ſmall wandering Flame, like that of burning Brandy. This Spot lies on a ſteep Rock of rotten Slate; but the Flame does not ſeem to proceed from any Hole or Fiſſure in the Rock, nor can one perceive any Matter proper to feed it, or any Aſhes produced. There is indeed a Kind of white and very ſharp Salt-petre to be found at ſome Diſtance from the Flame, which probably is fed by ſomething of that Nature; but it is remarkable that this Flame burns much briſker in Winter than in Summer, decreaſing gradually as the Heat increaſes, till it ſometimes goes quite out, and afterwards kindles again of itſelf. It may eaſily be lighted by any other Fire, and when this is done it is attended with ſome Noiſe.

IN the Road from *Grenoble* to *Lyons* there is a large Cavern or Grotto, very wide at the Entrance, but growing narrower by Degrees, till we come to a Lake, (as it is call'd) which is reckon'd another of the Wonders of *Dauphiné*.

phiné. But we cannot learn that this Lake is any more than a Rivulet or Brook, which is common enough in Places of this Nature*.

THERE is a remarkable Fountain at *Peroul* near *Montpelier* in *Languedoc*, which heaves and boils up furiouſly in ſmall Bubbles. This manifeſtly proceeds, (as Dr. *Robinſon* obſerved) from a Vapour breaking out of the Earth; for upon digging near it, and pouring other Water upon the Place newly dug, the ſame Bubbling immediately enſued: And in ſeveral dry Places thereabouts are found many ſmall Ventiducts or Spiracles, at which a Steam iſſues forth, ſtrong enough to remove light Bodies, ſuch as thin Straws, Leaves, or Feathers. It is obſervable that this Vapour does not take fire upon the Application of a lighted Candle, like the Fumes emitted from the boiling Spring near *Wigan* in *Lancaſhire.*

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* However this be, the *French* Hiſtorian *Mezeray* tells us very ſeriouſly, that *Francis* I, who loved to enquire into curious and extraordinary Phænomena, had a mind to be acquainted with the Particulars of this ſubterraneous Lake, and for that Purpoſe order'd a flat-bottom'd Veſſel to be built in the Cave that leads to it, which was done accordingly. On each Side of this Veſſel they faſten'd ſeveral Boards, on which they placed a great many lighted Torches and having provided Matches, Steel, Flints, and other Neceſſaries, with very able Watermen, they put off from the Shore with the King. After they had row'd ſome time, they perceiv'd the Breadth of the Lake was about half a League; but going near two Leagues farther, they heard a great Noiſe, which became more frightful as they advanced; and they found the Water ran with prodigious Swiftneſs. Imagining from hence there might be ſome Abyſs not far off, they looſen'd one of the Boards with the Torches upon it, and ſet it adrift; which, being carried away with a vaſt Rapidity, was ſoon overſet or ſwallow'd. Terrified with this they would venture no farther, but return'd to the Entrance of the Grotto.

SEVERAL Places in *Bigorre*, a Part of *Gaſcony*, are noted for their Mineral Waters, and particularly their Hot Baths, to which People reſort in Spring and Autumn. The chief of theſe Baths are at *Bagneres*, which were known to the ancient *Romans*, from whence it was call'd *Vicus Aquenſis.* They are of various Degrees of Heat; but their Waters do not change the Colour of Metals put into them, like thoſe of *Bath* in *England.*—*Barege* is a Village at the Foot of the *Pyrenean* Mountains, where there are four Baths of different Degrees of Heat. The Water of the hotteſt ſmells like the Mud of the Sea, and the very Steam of it will turn Silver firſt red and then black; but the Alteration is quicker if the Metal be put into the Water itſelf. The ſecond Bath is of the ſame Nature, but not quite ſo hot. The Water of the third is leſs hot ſtill; and that of the fourth is but lukewarm, being very much weaken'd by a Mixture from ſome cold Springs. Theſe Baths are reckon'd good to remove Rheumatic Pains, and ſeveral other Diſorders.

Moulins, the Capital of the *Bourbonnois*, is famous for its medicinal Waters; and indeed this Duchy has more mineral Springs than any other Province in *France*. The little Town of *Vichi* is noted on this Account; but the Waters of *Bourbon-l'Archambaud* have been moſt frequented of late, being eſteem'd of great Efficacy againſt the Gout and other nervous Diſtempers. They are impregnated with Bitumen and an alkaline Salt; ſo that if an Acid be put into them it cauſes a Fermentation, and they will turn Syrup of Violets green, like Oil of Tartar[*].—A great many other mineral Springs might be mention'd, but as they are not more remarkable than thoſe already enumerated, we ſhall conclude this Article, only juſt taking Notice of a Lake near *St. Omer's*, which is famous for the following extraordinary Curioſity.

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[*] We ſhall not pretend to give an accurate Definition of the Terms *Alkali* and *Acid*, ſince the Chymiſts themſelves do not ſeem to have any determinate Notion or ſure Marks whereby to know them diſtinctly. It may ſuffice for our Purpoſe to obſerve, that in the modern extenſive Senſe the Name of *Alkali* is given to any Subſtance, upon the Mixture of which with an *Acid* there enſues an Effervеſcence and Ebullition; though the famous *Boerhaave* will not allow this Effect to be ſufficient to determine the Nature of an *Alkali*, but takes in other Properties and Conſiderations, particularly their Taſte, the Manner of procuring them, and the Change of Colour they produce in Bodies. With regard to this laſt Circumſtance, thoſe Liquors which being poured on Syrup of Violets change it to a green Colour are *Alkali's*, and thoſe which turn it red are *Acids*. Thus Oil of Tartar turns it to a kindly Green, and Oil of Vitriol to a Carmine Red.

IN this Lake there are ſeveral *Floating Iſlands*, which are moved backwards and forwards by means of Poles, Ropes, *&c.* Graſs grows on theſe Iſlands, and the People draw them near the Shore to drive their Cattle into them; there are alſo ſome Trees, but they are kept low, for fear the Wind ſhould lay hold of them, and drive the Iſlands with too much Violence. There are no Houſes upon them however, much leſs a Church and Monaſtery, as ſome have aſſerted.

FRANCE abounds with Quarries of excellent Marble, and has its Mines of Iron, Copper, and Lead, and even ſome of Gold and Silver, which laſt are not work'd at preſent, the Profit not anſwering the Expence. Near *Alet* in particular, a Village at the Foot of the *Pyrenean* Mountains, it is ſaid that Gold was dug in the Time of the *Romans*; and the Rivulets that ſpring from thence do ſtill carry a golden Sand along with their Waters. In 1672 M. *Colbert* got theſe Mines to be work'd, but finding only a few Veins of Copper, the Undertaking was ſoon laid aſide.—Having therefore nothing extraordinary to ſay under the Head of Metals, Minerals, or other Foſſils, we proceed to that of Vegetables.

VEGETABLES.

AS we are now going to ſpeak of ſome of the vegetable Productions of *France*, we ought in Juſtice to begin with the *Vine*, that noble Plant or Shrub of the reptile Kind, ſo valuable for its Fruit and the rich Liquor it affords. This Plant was firſt brought from *Aſia* to *Europe*; and the *Phœnicians*, who were early Navigators, eſpecially along the *Mediterranean* Coaſts, tranſferr'd it to moſt of the Iſlands, as well as the Continent. It ſucceeded admirably in the Iſles of the *Archipelago*, and was afterwards introduced into *Greece* and *Italy*. From thence it paſs'd the *Alps*, being found at *Marſeilles* and other Places when *Gaul* was conquer'd by *Julius Cæſar*: But the Cultivation of the Vine was prohibited by *Domitian*, and neither the *Gauls* nor *Spaniards* were permitted to plant it till the Reign of the Emperor *Probus*, who was ſenſible that the Promotion of Agriculture ought to be inſeparable from a good Government. Vines were at length propagated through all *France* and *Spain*; the *German* Nations on the Banks of the *Rhine* follow'd the Example; and by Degrees they were planted in all Countries where there was any Probability of their Succeſs*.

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* It appears by Experience, that Vines are capable of being cultivated in *England*, ſo as to produce large Quantities of Grapes, and thoſe ripen'd to ſuch a

THE Species of Vines are almoſt infinite, and the Manner of their Culture is different in different Countries. The Plant itſelf is naturally weak, but Nature has furniſh'd it with ſmall Tendrils*, which it claſps round Bodies

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Degree, as to afford a ſubſtantial vinous Juice; nor does it ſeem ſo much owing to the Inclemency of our Air, as to the Want of a juſt Culture, that our Grapes are generally inferior to thoſe of *France*. Several of our Vineyards have ſucceeded to Admiration, particularly that at *Bath*, which is planted with white Muſcadine and black Cluſter Grapes, and which (though not above ſix or ſeven Acres of Ground) yielded, in the Year 1736, no leſs than fourſcore Hogſheads of excellent Wine.—It is to be obſerv'd, that the forward Grapes are fitteſt for the *Engliſh* Climate.

* The Contrivance of Tendrils or Claſpers is various in various Kinds of Vegetables, but admirable in all. Thoſe of Ivy are cover'd with Hair, and what is very remarkable, they yield a glutinous Humour, by which they adhere cloſely to Stones, *&c.* In this Plant they not only ſerve for Support, but for a Supply of Juice; for as Ivy mounts very high, and is of a compact Subſtance, the Sap would not be ſufficiently furniſh'd to the upper Sprouts, without theſe aſſiſted the Mother-Root. Sometimes Claſpers ſerve for Support only, as thoſe of the Vine, Briony, *&c* whoſe Branches being long and ſlender would be weigh'd down by their own Load, and that of their Fruit, were it not for theſe Claſpers, which by a natural Spire or Circumvolution catch hold of any adjacent Body. This Sort of Aſſiſtance, "ſo nicely accommodated to the Indigencies of ſome helpleſs Vegetables, and not to be met with in any others, is a manifeſt Indication (as Dr. *Derham* obſerves) of their being the Contrivance and Work of the Creator, and that his infinite Wiſdom and Care

that occur in its Way, and ſupports itſelf by their Aſſiſtance. In *France* it is rais'd on a ſingle Prop; but in ſome Countries it is cuſtomary to ſupport it by a ſtrong Reed, a Pole, or wooden Forks. It is common in *Greece* and *Italy* to train up the Vines to Elms*, along the Branches whereof they extend themſelves unreſtrain'd, and gradually aſcend to the Top. In *Aſia*, where they have ſeveral Species of very large Grapes, they diſpoſe their Vines on rais'd Works of Lattice, which form ſo many Ar-

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"condeſcends even to the "Service and Well-being "of the meaneſt, moſt weak, "and helpleſs inſenſitive "Part of the Creation." *Phyſico-Theol.* p. 419.

* This was an ancient Practice in *Italy*, as appears from many Paſſages in the Claſſicks, particularly *Virgil*, who deſcribes it in the following Lines:

——— *Supereſt* ———
Tum læves calamos, & raſæ haſtilia virgæ,
Fraxineaſque aptare ſudes, furcaſque bicornes,
Viribus eniti quarum & contemnere ventos,
Aſſueſcant, ſummaſque ſequi tabulata per ulmos.
GEORG. L. II.

The next Precaution of his rural Cares
A Range of Reeds and forked Props prepares:
On theſe the Vines their claſping Progreſs form,
And brave the Rigours of each riſing Storm;
Aſcend the hoſpitable Elm, and ſpread
Their ſwelling Cluſters o'er its verdant Head.

It is certain however, that thoſe Vines which run at liberty upon high Trees, and are never pruned, afford the ſmalleſt Wines; thoſe that are tied to Stakes about four Feet high, and are duly pruned, yield ſtronger Wines; and thoſe yet ſtronger that are kept nearer the Ground.

bours, under which the Natives enjoy a refreſhing Shade. In a Word, the Inhabitants of each Country practiſe ſuch Methods as they think are beſt adapted to their Neceſſities; but none ſeem to be better acquainted with the Management of the Vine, and conducting the Proceſs of a Vintage, than they are in ſeveral Provinces of *France*, eſpecially in *Champagne* and *Burgundy*.

THE Vine ſhould never be planted in ſuch ſtrong Soils as are fit for Corn, but in one that is thin and light, rather dry than moiſt, and intermix'd with Gravel; and the Declivity of a Hill, lying to the South, is the beſt Situation for a Vineyard. The Propagation of the Vine is by Slips or Suckers, which ſhould ſtand two or three Years in a Nurſery before they are tranſplanted into the Vineyard; and it may likewiſe be propagated by Layers, that is, by bending ſuch of the fineſt Shoots as ſhould otherwiſe be pruned off, and burying the old Wood in a little Trench, while that which is young riſes above the Surface. Some Vine-Dreſſers think the Spring is the only proper Seaſon for pruning; but thoſe who perform that Operation immediately after the Fall of the Leaf will be convinced of the Advantage of it the enſuing Year. Thoſe Vines in *France* that are ſuffer'd to ſhoot to the Height of five or ſix Feet are laid down in a Trench once in fifteen Years, and cover'd with Earth; and three or four of the fineſt Shoots are extended in little Trenches on each Side, in order to furniſh ſo many Layers. This is done in *November*; and the old Wood, by thus exerting itſelf in a freſh Soil, reſumes a new Vigour. But the Vines of low Growth, which produce the beſt Wine, and are not permitted to aſcend above three Feet at moſt, are laid in the Earth every Year, but not ſo deep as the former. The Depth to which the high Vines are laid in the Ground makes it unneceſſary to furniſh them with new Earth; but the low Vines muſt have a Supply every twelve or fifteen Years. A moderate Quantity of Dung ſhould likewiſe be applied to Vines every ſeventh Year where the Soil is very light, and every twelfth Year where it happens to be ſtronger. The propereſt Time for training Vines to their Prop is when the Flowers are juſt appearing; and about the ſame Time the Ends of the Branches ſhould be cut off, and the little Shoots retrench'd that riſe from the Bottom and Sides of the Stock. It is alſo neceſſary, at different Times, to clear away the Weeds that ſpring about the Stems of Vines, whereby the Earth is either chill'd or impoveriſh'd.

WHEN the Grapes are ripe, thoſe who are curious in their Wines make three different Gatherings, firſt chuſing the Bunches that are moſt ripe, and have the feweſt but fineſt Grapes, and are careful to pick off all rotten or ſcorch'd Berries, together with ſuch as have been pierced by Inſects. In the ſecond Gathering they pick off the large thick Cluſters, that are not quite ſo ripe as the others; and laſtly, thoſe that are green, wither'd, or rotten. Each of theſe Gatherings are preſs'd ſeparately, and what Difference there muſt be in the Wine may be eaſily apprehended. The Grapes intended for White Wine are preſs'd immediately after they are gather'd; but thoſe for Red Wine are not preſs'd till they have been trodden, or ſqueez'd between the Hands, and the Skins and Pulp have ſtood together in the Vat to acquire the requiſite Tincture. And here it may be worth obſerving, (what many People are not acquainted with) that all White Wine is not made from white Grapes; but the very beſt and whiteſt Wine, even that of *Champagne*, which has the Complexion of Cryſtal, is produced by the blackeſt Grapes. The Wine of theſe Grapes, if not bruiſed, nor heated much by the Sun after they are gather'd, but immediately carried to the Preſs, will be perfectly white; but the Wine produced by the ſecond, third, fourth, and fifth Preſſings will be gradually redden'd, as the Preſs operates more effectually on the Skin of the Grape: And therefore the Grapes for Red Wines are trampled and thrown into the Vat before they are preſs'd, (as above obſerv'd) it being found by Experience that the Complexion of thoſe Wines is paler or deeper, according as the Juice of the Skins is intermix'd with that of the Pulp in a leſſer or greater Degree.

THE Wine being drawn out of the Vat, and diſtributed into proper Veſſels, is ſuffer'd to ferment in the Air for ſome Days, which are more or leſs according to the Ripeneſs of the Grapes and the Temperature of the Seaſon. Then the Veſſels are gently ſtopp'd, ſo as to let the moſt fiery Particles of the Wine exhale for ſome Time; after which it is lodged for the Winter in an upper Cellar, from whence it is removed into lower Vaults as ſoon as hot Weather returns, but is kept there no longer than the Cloſe of Autumn.—As to the Management of Wines in the Cellar, the Manner of drawing them off from the Lees, the Expedients uſed to fine them down, *&c.* the Particulars are too many, as well as too foreign to our Purpoſe, to be here related.

THE *Olive-Tree* claims our Attention in the next Place, and perhaps ſome may think we ſhould have given it the Preference to the Vine, as it yields an Oil of almoſt univerſal Uſe in Food, Medicine, and the Manufactures. It thrives to Perfection in the Southern Parts of *France*, particularly in *Provence*, the Oil of which Country is by ſome preferr'd to that of *Spain* or *Italy*. The Leaves of the Olive-Tree very much reſemble thoſe of the Willow; and its Fruit, which has a Stone in it, is about the Size of a ſmall Nutmeg. The Olives, whilſt upon the Tree, are exceeding bitter; but this Bitterneſs is corrected by the Method of curing ſuch as are preſerv'd for eating. Thoſe intended for this Uſe are gather'd long before the Olives are fit to yield their Oil, and laid to ſteep for ſome Days in freſh Water; after which they are put into a Lye made of Aſhes and Lime, and then remov'd into a Liquor of Water and Salt, with which they are put up into little Barrels to be ſent abroad. To give them a fine Flavour, they throw over them an Eſſence compoſed of Cloves, Cinnamon, Coriander, Fennel, or other Aromatics; for this is a Secret amongſt thoſe who deal in Olives, in which indeed lies all the Difficulty of the Preparation.—To extract Oil from Olives, they are bruiſed under a Mill-ſtone and reduced to a Paſte; which being mix'd with hot Water, and afterwards preſs'd, the Oil ſwimming uppermoſt is eaſily ſeparated. This is what we call *Sallad Oil*, and in thoſe Countries where Olives grow it is commonly uſed inſtead of Butter, of which they have no great Plenty.

WE ſhall finiſh this Article with the *Larch-Tree*, which is pretty much like the Fir, and very uſeful in Building, being almoſt as durable as Cedar. It grows on many of the Mountains of *Dauphiné*, and it is ſaid that about *Briançon* they gather a Kind of Manna that falls upon its Leaves in the Night-time; but this is one of the pretended Wonders of that Province. This however is certain, that it produces Agaric*, a Sort of fungous Excreſcence growing on its Trunk or large Branches, which is of Uſe in Phyſic and in dying Scarlet.

ANIMALS.

THOUGH the *Silk-Worm* is not originally a Native of *France*, nor even of *Europe*, yet as the *French* breed and manage them very ſucceſsfully in their Southern Provinces, and have brought their Silk Manufactures to great Perfection, we think this is not an improper Place to give an Account of that wonderful and profitable Inſect. It was not till the Year 555, or thereabouts, that two *Greek* Monks, returning from the *Indies* to *Conſtantinople*, brought with them a Number of Silk-Worms, and alſo Inſtructions for hatching their Eggs, rearing and feeding the Worms, drawing out the Silk, *&c.* upon which Manufactures were ſet up at *Athens*, *Thebes*, and *Corinth*. In the twelfth Century *Roger* King of *Sicily* eſtabliſh'd a Manufactory at *Palermo* and another in *Calabria*, having brought Workmen from the Cities of *Greece* which he had conquer'd in his Expedition to the *Holy Land*; and by degrees the reſt of *Italy*, as well as *Spain*, learn'd the Art from the *Sicilians* and *Calabrians*. In the Reign of *Henry* the Second the *French* began to imitate their Neighbours, and with good Succeſs; and our King *James* I. was very deſirous of having Mulberry-Trees planted and Silk-Worms propagated in *England*, where from various Experiments it appears they will thrive and work as well as in any other Part of *Europe*.

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* Agaric grows chiefly on the Larch-Tree, but is alſo found on ſeveral others. This of *Dauphiné* is not ſo good as that brought from the *Levant*, which is found in *Muſcovy* and *Tartary*. It is light, ſmooth, brittle, of a bitter Taſte, and was a Medicine in great Repute among the Ancients, but is almoſt baniſh'd out of the preſent Practice.

THIS Inſect, from a ſmall Egg about the Size of a Pin's Head, becomes a pretty large Worm or Maggot, of a whitiſh Colour inclining to Yellow. In this State it feeds on Mulberry-Leaves, till being come to Maturity it winds itſelf up in a ſilken Bag or Caſe, about the Size and Shape of a Pigeon's Egg, and is metamorphoſed into an *Aurelia**. Thus it remains without any Signs of Life or Motion, till at length it awakes to become a Butterfly, after making itſelf a Paſſage out of its ſilken Sepulchre. It dies at laſt, having by its Egg or Seed prepared itſelf for a new Life, which the Warmth of the enſuing Summer enables it to reſume.—But to be a little more particular.

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* The Terms *Aurelia*, *Chryſalis*, and *Nympha*, are uſed by Naturaliſts to ſignify very near the ſame Thing. As ſeveral Inſects undergo a Change of Form, they ſeem to paſs through an intermediate State, to acquire a new Conception and a ſecond Birth; being for this End wrapp'd up in a Sort of Caſe or Foldage, that varies according to the Nature of the Animal. In this State the Inſect is call'd a *Nymph*, which ſignifies a *young Bride*, either becauſe it is veil'd or cover'd from the Sight, or becauſe it then puts on its moſt beautiful Attire. The Term *Chryſalis*, or *Aurelia*, is moſt applicable to thoſe Inſects whoſe Films or Coverings in this State are tinged with a yellowiſh or golden Colour. — Some apply the Word *Nympha* to Inſects whilſt in the Egg, and others as long as they retain the Form of Worms or Maggots.

THERE are two Methods of bringing up theſe curious Inſects, either by letting them expatiate at full Liberty on the Mulberry-Trees that nouriſh them, as is practis'd in *China* and other hot Countries; or elſe (as is cuſtomary in *Europe*) by keeping them in Rooms furniſh'd for that Purpoſe with a Sort of Hurdles made of Oſier Twigs, which are fix'd in horizontal Ranges one above another; and under every Range there is a Floor, which, like the Bottom of a Cage, may be drawn out at pleaſure. Over theſe Hurdles are ſtrew'd Mulberry-Leaves, upon which the Inſects feed; and they are ſupplied with freſh Leaves every Morning. The Leaves ſhould be gather'd in a dry Seaſon, and kept in a Place where no Moiſture can come. In fine Weather freſh Air ſhould be let into the Room from Time to Time, and great Care taken to keep the Place as neat as poſſible, particularly to cleanſe the Floors appointed to receive the Fragments of their Leaves and other Impurities; for Cleanlineſs and good Air contribute greatly to their Growth and Welfare.

THE Worms are hatch'd in Boxes lin'd with Linen or Paper, over which it is uſual to ſpread ſome ſoft Mulberry-Leaves; and from hence, when they have gain'd a little Strength, they are remov'd to the Ranges of Hurdles abovemention'd. When the Silk-Worm leaves its little Egg it is perfectly black, but its Head is of a more ſhining Sable than the Body. In a few Days it aſſumes a whitiſh Hue, or an Aſh-Grey; after which its Coat ſullies, and becomes ragged, at which Time the Animal caſts it off, and appears in a new Habit. As it increaſes in Bulk it grows whiter, but a little inclining to a Green; till ceaſing to feed, and ſleeping for almoſt two Days, it diveſts itſelf of its Skin a ſecond Time, and appears in its third Habit; its Colour, Head, and whole Form being ſo much changed, that one would take it for another Animal. It now begins to eat again, and continues to do ſo for ſome Days, when it relapſes into its former Lethargy, at the Concluſion of which it once more quits its Covering; and having continued feeding ſome time longer, at length it renounces all Feaſting and Society, and prepares for a Retirement by building itſelf a ſilken Cell of an admirable Structure and Beauty.

THE Beginning of this curious Work looks like Confuſion, being only a Sort of Down or Flue to keep off the Rain, Nature having ordain'd them to work upon Trees in the open Air, though we now bring them up in the

Houſe. This is the Inſect's firſt Day's Employment: On the ſecond it forms its Ball or Cone, almoſt covering itſelf over with Silk; and the third Day it is quite hid, and the reſt of the Operation becomes inviſible; but it continues ſpinning for ſeveral Days, till the Cone is brought to Perfection; and then folding itſelf in a Sort of Shell, form'd of a leſs delicate Silk intermix'd with a glutinous Matter, it takes its Repoſe. Having remain'd in this State fifteen Days, or three Weeks, and ſometimes longer, it is converted into a perfect Butterfly, which forces its Way out at the ſmall End of the Cone, that being not ſo ſtrongly cemented nor ſo exactly cloſed as the reſt of the Covering.

BEFORE the Butterfly leaves its Apartment, it frees itſelf of all that ſuperfluous Humidity which had been ſerviceable to it in its former State; by which Evacuation the Silk is ſoil'd and damaged, as well as by the Opening the Creature makes for its Eſcape. To prevent this, the Cones deſign'd for Uſe are expoſed to the Heat of the Sun, or laid in an Oven, by which means the Inſect is deſtroy'd before it comes to the State of a Butterfly; thoſe only being permitted to arrive to that Maturity, which are deſign'd to lay Eggs for a future Stock of Silk-Worms; and a ſmall Number is ſufficient for this Purpoſe, ſince one female Fly ſometimes lays above five hundred Eggs.

IN order to wind off the Silk, the Down is clear'd away in the firſt Place, and the Cones thrown into a Copper of warm Water, where they are ſtirr'd about with ſmall Twigs bound together and cut like Bruſhes; by which means the Ends of the Silk being diſengag'd are apt to catch on the Twigs, and ſo are drawn out and faſten'd to the Reel; eight, ten, or twelve of them being join'd together, according as they would make a weaker or a ſtronger Thread. The Workman then gives Motion to the Reel by turning the Handle, guides his Threads, ſubſtitutes new ones when any of them break, and ſtrengthens them where neceſſary by adding others, till the Silk is exhauſted*. Then the Cones, after opening them with Sciſſars and taking out the Inſects, (which are of ſome Uſe for the feeding of Poultry) are ſteep'd three or four Days in Water, which is changed every Day to prevent their ſtinking; and being thus ſoften'd, and clear'd of their gummy Matter, they are boil'd in a Lye of Aſhes well ſtrain'd, then waſh'd in a River, and dried in the Sun.

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* Some, who have conſider'd attentively the Fineneſs and Length of the Thread which the Silk-Worm ſpins, think they ſpeak within Compaſs when they affirm, that each Cone or Ball contains Silk enough to reach the Length of ſix *Engliſh* Miles. This however is certain, that an ingenious Perſon having meaſured the Silk drawn from one of theſe Balls, it was found to be a great deal above three hundred Yards, and yet weigh'd but two Grains and a half. —See BOYLE *de Subtilit. Effluv.* C. 2.

Thus prepared they are carded like Wool, and yield a Kind of ſilken Flax, which is ſpun with a Wheel, and woven into Stuffs of an inferior Value.

To what we have ſaid concerning the Silk-Worm, it will not be improper to ſubjoin a ſhort Account of the Silk of Spiders, which the *French* have had the Curioſity to manufacture into Gloves and Stockings. The Diſcovery is owing to M. *Bon*, a Member of the Academy at *Montpelier*, who in the Year 1710 publiſh'd a Diſſertation on the Subject, wherein he reduces all the different Sorts of Spiders to two principal Kinds, *viz.* ſuch as have long Legs, and ſuch as have ſhort ones, which laſt are thoſe that furniſh the Silk. Theſe Animals ſpin their Silk out of the *Anus*, around which are five *Papillæ*, or ſmall Nipples, whereby the Threads are form'd, ſome weaker and ſome ſtronger, according to the Uſe for which they are deſign'd. The weaker Sort of Threads are thoſe which ſerve to make their Webs, in which they catch Flies; but they ſpin a much ſtronger Kind, wherein they wrap up their Eggs, and by that means preſerve them from the Cold, and from ſuch Inſects as would deſtroy them. Theſe Threads they wind very looſely round the Eggs, reſembling in Shape the Balls or Bags of Silk-Worms that have been prepared and looſen'd for the Diſtaff. Having collected twelve or thirteen Ounces of theſe Bags, M. *Bon* had them well beaten for ſome time with the

Hand and a ſmall Stick to get out the Duſt. He then waſh'd them in warm Water, changing it ſeveral times till they left the Water very clean, and afterwards laid them to ſteep in a large Veſſel with Soap, Salt-petre, and Gum Arabic. Then letting the Whole boil together two or three Hours over a gentle Fire, he waſh'd them again with warm Water to free them from the Soap, and laid them to dry ſome Days to fit them for carding; which was perform'd by the Silk-Carders, but with Cards much finer than ordinary. By this means he had a Silk of a particular Aſh-Colour, which was eaſily ſpun, and the Thread was ſtronger and finer than that of common Silk. Of this he had Stockings and Gloves made, and found that three Ounces of it would make a Pair of Stockings for the largeſt Man, whereas thoſe of common Silk weigh ſeven or eight Ounces.

THE Poſſibility of making this Silk being ſhewn, the only Difficulty lies in procuring a ſufficient Quantity of Spiders Bags; which would be no Difficulty at all, if we had the Art of breeding them as they do Silk-Worms; for Spiders multiply much more, and are not ſo ſubject to Diſeaſes. M. *Bon*, who kept a great Number of young Spiders in Paper Coffins and Pots cover'd with Paper prick'd full of Pin-Holes to give them Air, obſerv'd, that of ſeven or eight hundred ſcarce one died in a Year, whereas of a hundred Silk-Worms not forty lived to make their Bags. This Gentleman procured his Spiders in the Months of *Auguſt* and *September*, at which Time their Eggs are hatch'd, the old ones that laid them dying ſoon after.

FROM M. *Bon*'s Experiments it was at firſt ſuppoſed that great Advantage might have been made of theſe Inſects; but M. *Reaumur*, who was appointed by the *Royal Academy of Sciences* to make a farther Enquiry into this new Manufacture, has left us no Hopes of its ever turning to any Account. The natural Fierceneſs of the Spiders (he obſerves) renders them unfit to be bred and kept together; for having diſtributed four or five thouſand into different Cells, fifty in ſome, a hundred or two in others, where they were fed with Flies and the bloody Ends of young Feathers, the large ones eat the little ones, ſo that in a ſhort Time they were almoſt every one deſtroy'd; and to this Inclination of devouring one another we may in ſome meaſure aſcribe the Scarcity of Spiders, conſidering the Number of Eggs they lay. It is therefore impoſſible to eſtabliſh theſe Creatures into a Community; and were it practicable, it would require too much Room and Application, becauſe a much greater Number of Spiders than of Silk-Worms would be neceſſary to produce the ſame Quantity of Silk, beſides that the Spider's Bag is inferior to that of the Worm both in Luſtre and Strength. According to M. *Reaumur*'s Computation, 2304 Worms will produce a Pound of Silk; and as he reckons the Work of twelve Spiders equals only that of one Silk-Worm, a Pound of Silk would require 27648 Spiders; nay, he ſuppoſes double that Number muſt be kept for that End, as the Bags are only ſpun by the Females.

WE might here deſcribe the delicate and wonderful Texture of the Spider's Web, and her Manner of weaving it; but as every one has an Opportunity of making his own Obſervations on theſe Matters, we ſhall paſs them by, and only take notice of an admirable Faculty ſome Species of theſe Inſects are endued with of conveying themſelves from one Place to another, which perhaps may be unknown to many of our Readers. The Spider having a Mind to change its Situation hangs perpendicularly by a Thread, and, turning its Head towards the Wind, ſhoots out ſeveral others from its *Anus*, like ſo many Darts, which being wafted to and fro by the Air faſten on Trees, Walls, or other ſolid Bodies. If the Inſect perceives they are faſt, which ſhe tries by drawing them in with her Feet, ſhe makes uſe of them as a Bridge to paſs to the Place where they are fix'd. But this is not all; for it has been obſerv'd that Spiders ſometimes dart out Threads to the Length of ſeveral Fathoms, and then, breaking the Thread which they hung by, let themſelves looſe and are carried ſwiftly through the Air, ſeizing (as is ſuppoſed) on Gnats and other Inſects in their Paſſage. In Autumn the Air is often fill'd with theſe floating Threads, which unite, lengthen, and ſtick to every thing in their Way; and this ſeems to be the chief Seaſon of the Spiders' ſailing in this Manner, though they dart their Threads at other Times, and breaking them off let the Wind carry them away*.

ANTIQUITIES.

MANY Parts of *France* abound with curious Monuments of Antiquity; and particularly at *Niſmes*, a very ancient City of *Languedoc*, there are ſtately Remains of a *Roman* Amphitheatre†, built of Free-ſtone, and of an extraordinary Bigneſs. The Outſide is adorn'd with Columns; and divers *Roman* Eagles, as alſo the Figures of *Romulus* and *Remus* ſucking a Wolf, are ſtill to be diſcern'd. At *Toulouſe*, in the ſame Province, are the Ruins of another; likewiſe at *Perigueux* in *Guienne*, at *Chalons* in *Burgundy*, at *Arles* in *Provence*, and at *Vienne* in *Dauphiné*.

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* The *darting* of Spiders was perhaps known to the Ancients, as may be conjectur'd from ſome Hints in *Ariſtotle* and *Pliny*; but as to their *ſailing* through the Air, it ſeems to have been firſt obſerv'd by Dr. *Hulſe* or Dr. *Liſter* in the laſt Century. The latter, in a Letter to Mr. *Ray*, ſpeaking of the Height that Spiders are able to fly to, ſays, that in *October* (1670) taking notice that the Air was very full of Webs, he immediately mounted to the Top of the higheſt Steeple on the Minſter [in *York*] and could there diſcern them yet exceeding high above him.—See *Derham's Phyſico-Theol.* p. 363.

† The Difference between a Theatre and an Amphitheatre is this: The former was almoſt ſemicircular, and intended for Plays or Dramatic Performances; the latter was of an oval Figure, like two Theatres join'd together, and was built for exhibiting publick Shews to the People, ſuch as the Combats of Gladiators, wild Beaſts, *&c.*

IN ſeveral Cities of *France* we alſo find the Remains of Triumphal Arches, which it was the Cuſtom of the Ancients to erect, not only to adorn a Triumph on returning from a victorious Expedition, but to preſerve the Memory of the Conqueror to Poſterity. There is one of theſe at *Rheims* in *Champagne*, conſiſting of three Arches, with chamfer'd Columns, and adorn'd with Baſs-Reliefs. The middle Arch, which is the largeſt, is thirty-five Feet high and fifteen wide, having on it the Figure of a Woman with two *Cornucopia's** in her Arms, which perhaps were intended to denote the Fruitfulneſs of the Country: Four Children about her expreſs the four Seaſons of the Year, and the twelve Months are repreſented by ſo many proper Figures. On one of the Side-Arches we ſee the Story of *Romulus* and *Remus* ſucking the Wolf, attended by the Shepherd *Fauſtulus* and his Wife *Acca Laurentia:* And on the other Arch is *Leda* embracing *Jupiter* transform'd into a Swan, and a *Cupid* lighting them with a Flambeau.—One of the preſent Gates of the City of *Orange* was a Triumphal Arch, erected by *C. Marius* on account of a Victory obtain'd over the *Cimbri* and *Teutones*, who made an Inroad into *Italy*. Here are alſo the Ruins of a *Roman* Circus*, and divers other Remains of Antiquity.

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* The *Cornucopia*, according to the Fiction of the ancient Poets, ſignifies a Horn out of which proceeded Plenty of all Things, given by *Jupiter* to his Nurſe *Amalthea* in Reward of her Services; though ſome apply it to the Horn of *Achelous*, ſaid to be broken off by *Hercules*, underſtanding thereby his ſtopping a Branch of that River from ſpoiling the Country, and the Fertility which thereupon enſued. In Architecture and Sculpture the *Cornucopia* is repreſented under the Figure of a large Horn, out of which iſſue Fruits, Flowers, &c.

NEAR *Autun* in *Burgundy* are ſeveral ancient Columns and Pyramids; but of all the Curioſities of this Kind in *France* there are none ſo much admired as a fine Obeliſk † of Oriental Granite ‡ at *Arles* in *Provence*, which is fifty-two Feet high, and ſeven in Diameter at the Baſe, and yet all but one Stone. It lay hid many Ages in the Ground in a private Garden near the *Rhone*, till the Magiſtrates cauſed it to be dug up in the Year 1675, and erected in the City, of which it is one of the nobleſt Ornaments.—At *Autun* we likewiſe ſee the Remains of a Temple of *Janus*, now call'd the *Janitoye*; and the Ruins of other Heathen Temples are to be found in ſeveral other Parts of the Kingdom.

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* The *Circi* were large Structures, generally of an oblong or oval Figure, built for the Celebration of ſeveral Sorts of Games or Exerciſes, *viz.* Wreſtling, Boxing, Fighting with Swords, Staves, or Pikes, Throwing the *Diſcus* or Quoit, Racing on Foot, on Horſeback, or in Chariots, *&c.*

† An Obeliſk is of a quadrangular Figure, not very broad at the Baſe, but growing narrower and narrower to the Top, which terminates obtuſely, and not in a Point like a Pyramid. The Difference between Obeliſks and Pyramids, according to ſome, conſiſts in this, that the latter have large Baſes, and the former very ſmall ones; but the Difference ſeems rather to be, that Obeliſks are of one ſingle Stone, and Pyramids of ſeveral.

‡ This is a very hard Sort of Marble, ſo call'd from its being ſprinkled over with a great many little Stains, reſembling Grains of Sand.

IT would be tedious to enumerate the Remains of Aqueducts, Public Baths, and other *Roman* Structures; and therefore to the Monuments of Antiquity already mention'd we ſhall only add that large round Buckler of maſſy Silver, (being twenty Inches in Diameter, and weighing twenty-one Pounds) which was fiſh'd out of the *Rhone* near *Avignon* in 1665. It is above 1900 Years old, and is charged with *Scipio Africanus*, half-mantled, attended by *Roman* Officers, and the *Spaniards* ſupplicating for a fair Virgin; it being conſecrated to that virtuous General upon his reſtoring a beautiful Captive to *Allucius*, Prince of *Celtiberia*, to whom ſhe was eſpouſed.

BUILDINGS.

WE ſhall begin this Article with the Cathedral of *Notre Dame* at *Paris*, not becauſe it is the fineſt Structure of that Kind, but becauſe it ſtands in the Metropolis of the Kingdom. It is an ancient *Gothic* Building, ſaid to have been founded by King *Childeric* in the Year 522, and finiſh'd by his Succeſſors; but it is rather ſtrong than magnificent. It is built in the Form of a Croſs, has a ſmall Spire in the Middle, and at the Weſt End two large ſquare Towers, flat at Top, with Galleries round them on the Outſide. The Statues of twenty-eight Kings of *France* are placed in a Row of Niches on the Front; and the Roof, which is very lofty, is ſupported by a hundred and twenty large Pillars. In the Choir there are a great many fine Paintings, rich Tapeſtry, and abundance of Gold and Silver Plate for the Service of the Altars. The High Altar is compoſed of the fineſt *Egyptian* Marble, and in ſhort the whole Choir is beautified in an extraordinary Manner, whether we regard the Richneſs of the Materials, or the Excellency of the Workmanſhip.

THE Cathedral of *Sens* in *Champagne*, which is dedicated to St. *Stephen*, is a large and ſtately Edifice, remarkable for the Figures that adorn its Front, and its two lofty Towers. The Inſide is admired for its rich Chapels, its ancient

Tombs, and particularly for its High Altar, at the Foot of which is a Table of Gold, enrich'd with precious Stones, repreſenting in Baſs-Relief the four Evangeliſts, and St. *Stephen* on his Knees.

THE Cathedral of *Rheims* in the ſame Province is a very fine Building, though in the *Gothic* Taſte; the Architecture is delicate, and the Gate and Portico are reckon'd the moſt ſtately in the whole Kingdom. It is alſo famous on account of its being the Church where the *French* Kings are uſually crown'd and anointed by the Archbiſhop of that City.

AT *Rouen* in *Normandy* the Cathedral Church, dedicated to the Virgin *Mary*, is a vaſt and beautiful Structure, having three lofty Towers, on one of which is a tall wooden Spire, cover'd with gilt Lead, that makes a pretty Appearance. Over the great Gate is a Triumphal Arch in honour of King *Henry* the Fourth, with Emblems of his Victories over the *Leaguers*, who are repreſented gnawing their Chains. In this Church are many magnificent Tombs of the ancient Dukes and Archbiſhops, and alſo that of *John* Duke of *Bedford*, who was Regent of *France* under *Henry* VI. of *England*. But the moſt remarkable Thing of all is the famous great Bell that hangs in one of the Towers, which is thirteen Feet high, and weighs about forty thouſand Pounds.

THE Cathedral at *Lyons*, dedicated to St. *John*, is a magnificent and venerable Fabrick;

and the Front of the High Altar, which ſtands in the Middle of the Choir, was formerly adorn'd with abundance of fine Images, moſt of which were defaced during the Civil Wars. This Church has long been famous for the ſurprizing Mechaniſm and Motions of its Clock, which is placed in an Iſle near the Choir. On the Top of it ſtands the Figure of a Cock, which every three Hours claps his Wings and crows thrice; whilſt a Door opens on one Side in a Gallery underneath, out of which comes the Virgin *Mary*, and from a Door on the other Side an Angel meets and ſalutes her. At the ſame time a Door opens above, from whence the Form of a Dove, repreſenting the Holy Ghoſt, deſcends on the Virgin's Head. After this they retire, and from another Door comes the Figure of a venerable Father, lifting up his Hands, and bleſſing the People. The Days of the Week are repreſented by ſeven Figures, each of which takes its Place in a Niche on the Morning of the Day it repreſents, and continues there till Midnight, when it retreats and is ſucceeded by another. There is likewiſe a very ſingular Curioſity belonging to this Clock, *viz.* an oval or elliptical Plate mark'd with the Minutes of an Hour, which are pointed to by a Hand reaching the Circumference, and which inſenſibly extends and contracts itſelf during its Revolution, ſo as exactly to fit the ſhorteſt as well as the longeſt Diameter.—But the Reader muſt ſuppoſe this is rather an Account of what the Clock has been formerly, than what it is at preſent, many Parts of it through Length of Time being much impair'd. *

THERE is another Cathedral that deſerves to be mention'd, namely, that of *Straſburg* in *Alſace*, which, though formerly a Part of *Germany*, is now annex'd to the Dominions of *France*, and therefore belongs to this Chapter. It is certainly one of the fineſt Churches in *Europe*, and its Steeple is a noble Pyramid, ſaid to be five hundred and ſeventy Feet high; but this is almoſt incredible. In this Church there is a Clock, which is look'd upon as a Maſter-piece of Aſtronomy and Mechanics, and, when in its Perfection, ſeems not only to have exceeded that at *Lyons*, but perhaps had not its Fellow in the World for the Variety of its Figures and Motions, many of which are now entirely ſtopp'd, or much out of Order.—The Baſis or Foundation as it were of this curious Machine conſiſts of three Plates, a ſquare one on each Side, and a round one in the Middle. This round one has three Circles, one within another, two of which are moveable, and the third fix'd. The outermoſt is ten Feet in Diameter, and turns about once in a Year, ſhewing the Months and Days. The Circle within this, whoſe Diameter is a Foot leſs, was made to turn round in the ſame Time, and ſhew the Vigils and Feſtivals; which it did during a whole Century, but is ſtopp'd at preſent. The innermoſt ſerves only for an Ornament, containing a Repreſentation of *Alſace* and the City of *Straſburg*, and is therefore immoveable. The two ſquare Plates uſed to point out the Eclipſes of the Sun and Moon, but they do not now perform that Service.—Above theſe three is another large Plate, in the Middle of which is an Aſtrolabe ſhewing the Courſe of the Heavens, with the four Seaſons painted round it. There is alſo a Dial-Plate which ſhews the Hours and Minutes; and underneath it the ſeven Days of the Week, repreſented by the ſeven Planets, paſs by turns in a Chariot. Here is likewiſe a Face of the Moon, ſhewing its Age and different Aſpects.—In the third or uppermoſt Part of this Machine are four Figures, repreſenting the four Ages of Man's Life, which come and ſtrike on ſmall Bells every Quarter of an Hour. A Cock made of Metal ſtands on the Top of an Arch, ſtretches out his Neck, and proclaims the Hour by crowing. Then comes Death, driven away by a *Chriſt* riſen from the Dead, who nevertheleſs permits him to ſtrike the Hour, that Men may remember they are mortal.—This wonderful

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* This Clock was repair'd and improved by one *Nouriſon* in 1661; but it was contrived long before that Time by *Nicholas Lipp*, a Native of *Baſil*, who finiſh'd it in 1598. After this, it is ſaid, he had his Eyes put out by the Magiſtrates of *Lyons*, that he might never be able to make ſuch another; but this Story is entirely groundleſs.—The elliptical Minute-Motion was invented by M. *Servier*, and is of a later Date.

Piece of Machinery was finiſh'd in the Year 1573, but who was the Artiſt that contriv'd it is unknown.

FROM the Churches we proceed to take a View of ſome of the Royal Palaces, and firſt of the *Louvre*, which is the chief Ornament of *Paris*. This ſtately Palace is ſituated on the River *Seine*, but has never been finiſh'd according to the original Deſign. The Weſt Front was finiſh'd by *Lewis* XIII, who built a large Pavilion, in Form of a Dome, over the Gate, ſupported by two Rows of Pillars of the *Ionic* Order. In the Middle of the Eaſt Front, which was built at a vaſt Expence by *Lewis* XIV, and is a hundred and ſeventy-five Yards in Length, is the principal Gate, with a Portico ſupported by forty *Corinthian* Columns. The Apartments within are anſwerable to the noble Appearance of the Building without; but we ſhall not attempt a more particular Deſcription of this Palace, as great Part of it was burnt down a few Years ago.

THE *Louvre* has a Communication with another beautiful Palace call'd the *Tuileries*, by a Gallery built by *Henry* IV, which fronts the River, and is reckon'd the fineſt in *Europe*. It is about 450 Yards long, and 10 Yards broad, and is fill'd with exquiſite Paintings and Sculptures. Underneath this Gallery is the Royal Printing-Houſe, and the Apartments of the King's Painters, Engravers, Carvers, and other ingenious Artificers. The Palace itſelf is one

Range of Building, with a ſquare Pavilion at each End, and a Dome in the Middle; and the Whole is adorn'd with Columns, Pilaſters, and other proper Ornaments. The Gardens behind it are exceeding beautiful, and towards the River there is a fine Terrace planted with Rows of Trees, near 600 Yards in Length and twenty-eight in Breadth, from whence there is a delightful Proſpect over Part of the City and the adjacent Country.

BUT of all the Royal Palaces there is none ſo deſervedly admired as that of *Verſailles*, about nine Miles from *Paris*; which from a ſmall Caſtle, or rather Country-Houſe, built by *Lewis* XIII. for a Hunting-Seat, is now become one of the moſt magnificent Palaces in the World. It ſtands on a riſing Ground in the Midſt of a Valley, ſurrounded with little Hills, at an agreeable Diſtance. The Avenues to it are very fine and ſpacious, particularly that on the Side towards *Paris*, which conſiſts of three Walks form'd by Rows of Elms, the middle one ſixty Feet wide, and each of the Side-Walks thirty. This Avenue ends in a large Square, which has a Fountain in the Middle of it; and from thence we aſcend to the great Court of the Palace, which is 480 Feet long, having on each Side Apartments for the Secretaries of State, and other great Officers of the Crown. Out of this Court there is an Aſcent of three Marble Steps into another leſs than the firſt, which is likewiſe adorn'd with a fine Fountain; and from thence we aſcend by five Steps into a third Court ſtill leſs than the former, which is paved with black and white Marble, and has a Marble Fountain and Baſon in the Middle, with Statues of gilt Copper. This Court is terminated by the Royal Palace, in the Front of which there is a ſtately Portico ſupported by eight Marble Pillars of the *Doric* Order, and three Iron Doors richly gilt and wrought, by which we enter into the Hall and Salons, and from thence proceed to the Apartments on the Right and Left. The principal Stair-Caſe, which conſiſts of the fineſt Marble, is ten Yards wide, and is adorn'd with admirable Paintings and Sculptures. Throughout this Palace indeed there is a vaſt Variety of moſt beautiful Marble; and in general the Rooms are very lofty, and richly furniſh'd, the Bedſteads and Tables in ſome of them being of maſſy Silver, or Materials of equal Value. It is obſervable, that the nearer we come to the King's Apartments, the more ſumptuous are the Marble, Sculptures, Paintings, and Furniture. The King's Bedchamber is adorn'd with excellent Carvings, all gilt on a white Ground; and the Bed, which is of Crimſon-Velvet embroider'd with Gold, is placed in a Sort of Alcove, wherein are two Figures of *Fame* repreſented ſitting, and *France* in the ſame Poſture, ſeeming to watch for the Preſervation of her Monarch. On one Side of the Bed is the

Picture of *David* playing on his Harp, and on the other St. *John* in the Iſland of *Patmos.* There are other fine Paintings in this Chamber, particularly one of *Hagar* in the Deſert, with her Son and an Angel.—The Front of this Palace that looks towards the Gardens is the moſt beautiful, having a Portico a hundred Yards long, paved with Marble, and ſupported by Marble Pillars. Here we ſee the Figures of the twelve Months of the Year; and in the emboſs'd Works that adorn the Front are Statues of little Children employed in Exerciſes proper to the Seaſons they repreſent. On this Side is a noble Gallery, above ſeventy Yards long, which has a fine Proſpect over the Gardens, and is fill'd with a great Variety of Buſts and Statues. On the Cieling the Battles and principal Actions of *Lewis* XIV, with other memorable Occurrences of his Reign, are curiouſly painted. The Cabinet of Rarities is of an octogonal Figure, in which we ſee a ſurprizing Collection of Curioſities in Agat, Cryſtal, Jewels, Medals and other Antiquities, with ſeveral Paintings by the greateſt Maſters. Every thing, in ſhort, that we caſt an Eye upon in this Palace is ſumptuous and beautiful; and we ſhould far exceed our Limits, if we ſhould barely enumerate the many fine Paintings and antique Statues with which the Apartments abound. The Halls of *Plenty*, of *Venus*, and of *War*, are all adorn'd with excellent Paintings; and in this laſt we likewiſe ſee the Buſts of ſix *Roman* Emperors in Porphyry, with a Drapery of gilt Braſs, placed on Pedeſtals of Oriental Alabaſter. —The Chapel is perfectly anſwerable to the Magnificence of the reſt of the Palace; and the very Stables, for Conveniency, Beauty, and Architecture, far exceed any in *Europe*, and are ſuperior to many Royal Palaces.

WHAT we have ſaid may give the Reader ſome faint Notion of this majeſtic Edifice; but we muſt not leave it without taking ſome Notice of its beautiful Gardens, which may be reckon'd among the modern Wonders. Coming down from the Terrace we meet with two Baſons, wherein are ſeveral Water-Spouts or *Jets d'Eau*, (as the *French* call them) and in the Middle of each is a Collection of Spouts in the Form of a Wheat-Sheaf, which throw up Water to the Height of nine and twenty or thirty Feet. The Borders of theſe Baſons are adorn'd with ſeveral Groups of brazen Figures, repreſenting Rivers, Nymphs, Cupids, *&c.* In the Angles of this Parterre are two other Baſons of Marble, wherein the Spouts form two fine Sheets of Water, and upon the Borders are ſeveral Figures of Animals, made alſo of Braſs. Below theſe Baſons is another very fine one, in the Middle of which is the Figure of *Latona*, with her two Children *Apollo* and *Diana*. She is ſuppoſed (according to the Story) to have made her Complaints to *Jupiter* of the ill Treatment ſhe met with from the Peaſants of *Lycia*, who for their Puniſhment are here repreſented as metamorphoſed into Frogs, which throw out above ſeventy Spouts of Water. The Figures are of white Marble, and the whole is reckon'd an excellent Piece of Sculpture. There are many other Fountains, Caſcades, *&c.* the Beauty of which can ſcarce be conceiv'd by any Deſcription; but what is moſt admir'd is the grand Canal, ſixteen hundred Yards long and ſixty-four broad, at each End of which is a large Baſon of an octogon Figure, and in the Middle it is interſected by another Canal about two hundred and ſixty Yards in Length. Upon this noble Canal the Court ſometimes divert themſelves in Yachts and Galleys.—The *Labyrinth*, or Maze, is a fine Grove, ſo call'd becauſe it is difficult to find one's Way out of it, the Walks being ſo interwoven with each other. At the Entrance we meet with two Statues, the one of *Æſop*, and the other of *Cupid* holding a Clue of Thread in his Hand, intimating to the Stranger the Neceſſity of ſuch a Guide to prevent his being loſt in the many intricate Windings of the Place. The Whole is adorn'd with Statues and Fountains, and particularly a Baſon of curious Shell-Work, wherein one of *Æſop*'s Fables is repreſented in the moſt natural Manner.—The *Orangery* or Green-Houſe is a noble Piece of Architecture, conſiſting of ſeveral Galleries, of which the largeſt is above four hundred Feet long and thirty broad, and all of them adorn'd with beautiful Columns of the *Tuſcan* Order. Before

fore this Green-Houſe is a fine Parterre, with a Fountain in the Middle of it, where the Water is ſpouted up to the Height of forty Feet; and the whole Parterre is adorn'd with Rows of Columns, Groups of Figures, Statues, Vaſes, and other Ornaments.

IT would be going far beyond our Bounds, to mention every Thing worth obſerving in theſe delightful Gardens; but there is one Particular more ſurprizing than any we have yet taken notice of, *viz.* the Manner whereby they are ſupplied with Water from the *Seine*, which is four or five Miles diſtant. This is done by a wonderful Engine ſtanding on a Branch of that River, whoſe Stream turns ſeveral large Wheels, which ſet two hundred and twenty-five Pumps a going; and by this means the Water is raiſed up into a Tower upon a Hill, above an Hundred and twenty Yards higher than the River. From hence it runs along an Aqueduct of thirty-ſix Arches, and from thence is convey'd thro' large Pipes to the Reſervoirs of *Marli*, another Royal Seat, remarkable for its fine Caſcades and other Water-Works; all which, as well as thoſe of *Verſailles*, are ſupplied from theſe Reſervoirs, ſo that the Canals, Baſons, *&c.* are always full in the drieſt Seaſons*.—*Lewis* XIV. had a Deſign of conveying the Water of the River *Eure* to *Verſailles*, and accordingly cauſed prodigious Works to be begun near *Maintenon* in the Year 1684, which were diſcontinued in 1688 on the breaking out of the War, and have been left unfiniſh'd. The magnificent Aqueduct erected on this Occaſion, conſiſting of 242 Arches, is yet ſtanding, and is perhaps the nobleſt in the World.

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* As the conveying the Water of the *Seine* to *Verſailles* at firſt coſt immenſe Sums, ſo the keeping this famous Machine of *Marli* in Repair is ſaid to be attended with an annual Expence of at leaſt 25,000 Pounds Sterling. And this has given a modern Hiſtorian Occaſion to

To deſcribe the ſtately Palace of *St. Germain*'s, that of *Fontainebleau*, and ſeveral others belonging to the *French* Monarch, together with their beautiful Gardens, would be in ſome meaſure a Repetition of what we have ſaid already, and carry us to an exceſſive Length. We ſhall therefore proceed to the Deſcription of a Structure of a very different Kind, but too remarkable to be omitted, *viz.* the famous Bridge over the *Rhone* at *St. Eſprit* in *Languedoc*, which is juſtly reckon'd one of the fineſt in *Europe*. This Bridge is of Stone, and of a great Length, conſiſting of twenty-ſix wide Arches, whoſe Feet or Piers are ſecured by two Pedeſtals that ſurround them, which have their Projectures, like Rows of Steps or Stairs, the lowermoſt projecting moſt, the others leſs by Degrees. A-

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obſerve, that *Lewis* XIV. ſhew'd his Grandeur, or rather his Vanity, by making Choice of a Place which had no Water near it, to erect the fineſt Water-Works in the World, which nothing but a boundleſs Treaſure could have effected.

bove theſe are ſeveral Windows or ſmall Arches, which divide the Feet of the great ones, and reach as low as the Plane of the uppermoſt Pedeſtal. As the *Rhone* is a very rapid River, this Bridge is admirably contrived to withſtand its Violence; for the unequal Juttings of the Pedeſtals ſerve gradually to break the Force of the Stream, and when the Flood ſwells ſo high as to cover them, (which it frequently does) the ſmall Arches or Openings in the Piers give a free Paſſage to the Water, which might otherwiſe endanger the Fabric. Beſides, the Bridge is not ſtrait, but bent in ſeveral Places, forming unequal Angles, which are greateſt where the Current is ſtrongeſt, and thereby its Fury is oppoſed and broken*.

THE Bridge of Boats at *Rouen* is a Curioſity that deſerves to be mention'd, with which we ſhall conclude this Article. It is about 260 Yards long, paved with Stone like a Street, and riſes and falls with the Tide, or as as Land-Waters ſwell the River. Carriages with the greateſt Burdens paſs over it with Safety, the Boats being very firm, and well moor'd with ſtrong Chains; but it is now grown old, and requires a great deal of Money to keep it in Repair.

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* The Bridge at *Lyons*, over the ſame River, has an Angle in the Middle pointing towards the Stream, the better to reſiſt its Violence; and this Contrivance is to be obſerv'd in ſome other Bridges. It is ſaid the great Pier in the Middle of *London* Bridge was intended to keep the whole Fabric ſteady, and to ſupply the Want of ſuch an Angle.

ARTS, MANUFACTURES, INVENTIONS, *&c.*

THE Care and Application of the *French* Miniſters to promote the Manufactories of their Country, and turn every Article of their Commerce to the national Advantage, is very remarkable, and worthy of Imitation. It was M. *Colbert*, that great Encourager of the Mechanical as well as Liberal Arts, who prevail'd with *Lewis* XIV. to eſtabliſh the Manufactory of the *Gobelins** at *Paris*, for the making of Tapeſtry and other Furniture for the Uſe of the Crown. The *Louvre*, the *Tuileries*, and other Royal Palaces being compleated under the Direction of that Miniſter, he began to think of making Furniture ſuitable to the Grandeur of thoſe Buildings, and with this View he got together the ableſt Workmen from all Parts of the Kingdom, particularly Painters, Tapeſtry-Makers, Sculptors, Goldſmiths, Embroiderers, *&c.* and by Offers of Money, Penſions, and Privileges,

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* The Houſe where this Manufactory is carried on belong'd to two Brothers, *Giles* and *John Gobelin*, who firſt brought to *Paris* the Secret of dying that beautiful Scarlet-Colour ſtill known by their Name; and *Lewis* XIV. having purchas'd this Houſe to ſet up the Tapeſtry Manufacture, he gave it, by an Edict, the Name of *Hotel Royal des Gobelins*.

vileges, he invited others from foreign Nations. Having perſuaded the King to purchaſe the Houſe of the *Gobelins* for them to work in, he drew up a Syſtem of Laws for their Regulation and Encouragement, one of which prohibited the Importation of Tapeſtry from any other Country. Ever ſince this Manufactory was ſet on foot, it has been the moſt celebrated of the Kind in *Europe*, having produced ſuch a Quantity of the fineſt Work, and ſuch a Number of excellent Workmen, as is almoſt incredible; and in effect the preſent flouriſhing Condition of the Arts and Manufactures of *France* is in a great meaſure owing to this Eſtabliſhment. Their particular Glory is their beautiful Tapeſtry, which they have made to a Degree of Perfection not inferior to what was anciently done by the *Engliſh* and *Flemiſh**. The Battles of *Alexander*, the four Seaſons, the principal Actions of *Lewis* XIV. done from the Deſigns of M. *Le Brun*, with other fine Pieces which

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* The Invention of Tapeſtry ſeems to have come from the *Levant*, being probably learnt there by the *Engliſh* and *Flemiſh* in ſome of the Croiſades or Expeditions againſt the *Saracens*. Be this as it will, it is certain thoſe two Nations, eſpecially the *Engliſh*, were the firſt who ſet on foot this noble Manufacture in *Europe*; ſo that if they are not allow'd to be the Inventors, they have at leaſt the Honour of introducing amongſt us ſo curious and admirable an Art, as gives a Kind of Life to Wools and Silks, not to be exceeded by the fineſt Paintings.

this Manufactory has produced, are ſome of the nobleſt Ornaments of the Royal Palaces.

THE *French* have alſo conſiderable Manufactories of Tapeſtry at *Aubuſſon*, *Felletin*, and *Beauvais*; and at *Arras* in *Artois* they are noted for their fine Tapeſtries, commonly call'd *Arras Hangings:* But of all the *Flemiſh* Manufactories, thoſe of *Bruſſels* and *Antwerp* are the beſt, where they ſucceed wonderfully either in human Figures, in Animals, or Landſcapes, and that both with reſpect to the Workmanſhip and the Deſign.

THERE are two Kinds of Tapeſtry, one of the *high Warp*, the other of the *low Warp*; though the Difference is rather in the Manner of working, than in the Work itſelf, the Looms of the former being Upright, whereas thoſe of the latter are flat or parallel to the Horizon. The Loom for Tapeſtry of the *high Warp* conſiſts of four principal Pieces, *viz.* two upright Planks or Cheeks, and two thick Beams or Rollers placed acroſs them, the one at top, the other at bottom about a Foot from the Ground. The Warp, which is a Sort of Worſted or twiſted woollen Thread, is wound on the upper Roller, and the Work, as faſt as it is wove, is wound on the lower. When the Loom is mounted with its Warp, the Pattern or Deſign to be repreſented on the Tapeſtry is placed cloſe behind it, and on the Fore-ſide of the Warp (*i. e.* that which is to be the right Side of the Piece) the Contours or Out-lines are drawn with a Black-Lead Pencil, ſo that the Strokes appear both before and behind. This done, the Pattern is wound on a long Staff, and hung up behind the Workman, who unrolls a Piece of it from time to time as the Work proceeds. Every thing being prepared, the Workman places himſelf on the wrong Side of the Piece, and with a Broach or Shuttle paſſes the Silk, Worſted, or other Materials of the Woof between the Threads of the Warp, which he brings acroſs each other with his Fingers, and ſtrikes the Woof cloſe with a Comb of Wood or Ivory. Thus he proceeds, changing his Colours according to his Pattern, and now and then going to the other Side of the Loom to view his Work, and correct the Contours by preſſing them cloſer with a Needle, if there be Occaſion. —This Manner of weaving Tapeſtry is very tedious, and is therefore almoſt every where laid aſide*.

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* M. *Le Blon* contrived a new Way of weaving Tapeſtry in the Loom with a Draw-Boy, which may be perform'd almoſt as expeditiouſly as fine Brocades; for when the Loom is once ſet and mounted, any common Draught-Weaver, though not acquainted with Drawing or Painting, nay, hardly knowing what Figure he is about, exactly produces what the Painter has repreſented in the original Pattern: And thus a Piece of Tapeſtry may be wove in a Month or two, which in the common Way of working (almoſt as tedious as Needle-Work itſelf) would take up ſeveral Years; and what has uſually coſt a thouſand Pounds may by this means be afforded finer and better for a hundred.—See *Phil. Tranſ.* N° 419.

THE Frame for the *low Warp* (which is the Method now chiefly in Uſe) is much like a Weaver's Loom, conſiſting of two ſtrong Pieces of Wood which form the Sides, and bear a Roller at each End, on the farther whereof the Warp is wound, and the Work, as it advances, on the nearer. The Deſign or Painting to be imitated by the Workman is placed underneath the Warp, ſo that he can ſee the Figures thro' it; and being ſeated on a Bench before the Loom, he takes a Flute, as it is call'd, (which does the Office of a Shuttle) mounted with Silk or Worſted of ſuch a Colour as his Piece requires, and having paſs'd it among the Threads of the Warp, which he raiſes or lowers by means of Treddles, *&c.* he beats the Woof cloſe with the Reed or Comb, which has uſually Teeth on each Side, and is made of Wood or Ivory as above mention'd.—One thing is very remarkable in the weaving of Tapeſtry, *viz.* that it is all wrought with the wrong Side towards the Workman, who in this laſt Method of working does not ſee the right Side of his Piece till it be finiſh'd and taken off the Loom.

AMONGST the other Manufactures of *France*, that of Silk is one of the moſt conſiderable, though not ſo flouriſhing as it has been formerly. When the Manufactures of *Lyons* were in their greateſt Proſperity, it was computed that eighteen thouſand Looms were employ'd in weaving Silks in that City and its Neighbourhood; but in the Year 1698 the Number was reduced to about four thouſand. *Lyons* however is ſtill noted for its Silk Manufactures, particularly its Taffeties, which are remarkable for their fine Luſtre. *Octavio May*, of *Lyons*, is ſaid to have firſt diſcover'd the Method of giving Taffeties this beautiful Gloſs, the Occaſion of which is thus related. *Octavio*, going backwards in the World, was one Day muſing on his Misfortunes, and happen'd to have in his Mouth ſome Hairs of Silk, which he kept chewing till his Reverie was over. Upon ſpitting out the Silk it ſeem'd to ſhine, which engaged his Attention, and led him to reflect on the Reaſon. After a good deal of Thought he concluded, that the Luſtre of the Silk muſt proceed, firſt, from his having preſs'd it between his Teeth; ſecondly, from its being wet with his *Saliva*, which had ſomething glutinous in it; and, thirdly, from its having been heated by the natural Warmth of his Mouth. By a proper Uſe of theſe Obſervations he found out the means of producing the ſame Effect upon the next Taffeties he made, and thereby ſoon acquired vaſt Riches to himſelf, and to the City of *Lyons* the Reputation it ſtill maintains, of giving a better Gloſs to Taffeties than any other City in *Europe*.

THE Machine invented by *Octavio* for this Purpoſe is much like a Silk-Loom, having a Beam at each Extremity, between which the Taffety is ſtretch'd to take the Gloſs or Luſtre. This is given it by rubbing it gently with a liquid Preparation as it is roll'd from one Beam to the other, whilſt at the ſame time it is dried by a Charcoal Fire placed on a Carriage underneath it. The Gloſs is given to black Taffeties by Beer and Orange-Juice boil'd together; but for colour'd Taffeties they uſe Gourd-Water diſtill'd in an Alembic.

WITHIN leſs than a Century paſt the *French* have greatly improved their Woollen Manufacture, which is chiefly owing to the Inſtructions of Foreigners who have ſettled amongſt them, and the clandeſtine Exportation of Wool from *England*. In the Year 1665 Mr. *Van Robets*, a *Dutchman*, ſet up a Manufactory of Woollen Cloth at *Abbeville* in *Picardy*, which has ſucceeded ſo well, that the Cloths made there are ſaid to be little inferior to thoſe of *England* or *Holland*. *Lewis* XIV. gave great Encouragement to this Manufactory, granting *Robets* and his People ſeveral Privileges, and particularly the Liberty of importing whatever was neceſſary for their Purpoſe without paying any Duty.—*Abbeville* is alſo conſiderable for its Manufactures of Linen, Sail-Cloth, Soap, and Fire-Arms.—And having mention'd Linen, we ought not to forget the curious Manufacture of fine Lawn, call'd *Cambrick*, from *Cambray*, the Capital of a Province in the *French Netherlands*, which is hardly to be equall'd in any Part of *Europe*.

TOWARDS the End of the laſt Century the *French* made a great Improvement in the Glaſs

Manufacture, by inventing a Method to caſt very large Plates, till then unknown, and ſcarce practiſed yet by any but themſelves and the *Engliſh*. The Invention is owing to the Sieur *Abraham Thevart*, who firſt propoſed it to the Court of *France* in 1688, where he met with the Encouragement he deſerv'd. By this Method (which is ſomething like the caſting of Sheet-Lead among the Plumbers) we are not only enabled to make Looking-Glaſs-Plates of more than double the Dimenſions of thoſe made the *Venetian* Way of blowing, but alſo to caſt all Sorts of Mouldings, Borders, and other Ornaments. The chief if not the only Manufactory of this Kind in *France* is at the Caſtle of *St. Gobin*, three Leagues from *Laon*, where the Number of Furnaces, Forges, Work-houſes for Smiths, Carpenters, *&c.* together with Apartments for theſe and other Workmen employed about the Glaſs, appear more like a Town than a Manufactory.

THE Melting-Furnaces uſed in this Manufacture are of a vaſt Size, and thoſe for annealing the Glaſſes when form'd are ſtill larger. Round a Melting-Furnace there are at leaſt twenty-four annealing Furnaces or Ovens, which are call'd *Carquaſſes*, each having two Tiſſarts or Apertures to throw in Fuel, and two Chimneys; and beſides theſe there are Furnaces for making Frit*, and calcining old Pieces of

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* This Name is given to the Matter or Ingredients whereof Glaſs is to be made, when calcined or baked in a

Glaſs. The Inſide of the Furnaces is made of a Sort of Earth that is able to ſuſtain the Action of the Fire, and the Melting-Pots and Ciſterns are made of the ſame. Theſe Pots are as big as Hogſheads, containing above two thouſand Weight of Metal; ſo the Workmen call the melted Matter of which the Glaſſes are form'd. The Ciſterns are much ſmaller, and ſerve for the Conveyance of the liquid Glaſs, which is

taken

Furnace, after which they are more readily melted and turn'd into Glaſs. The Materials uſed in the Compoſition of Glaſs are Salt, and Sand or Stone. The Salt is of the fix'd Kind, ſuch as will not evaporate with the moſt intenſe Heat; and is procured chiefly from the Aſhes of a Plant call'd *Kali*, *Glaſs-Weed*, or *Salt-Wort*, which grows plentifully in *Egypt* and *Syria*, and alſo on the Coaſts of *Provence* and *Languedoc*. The Salt extracted from the Aſhes of a Species of Kali growing about *Alicant* in *Spain* is reckon'd the beſt, and is uſed in making the Plate-Glaſs here deſcribed. The Aſhes of Fern alſo yield a Salt that makes excellent Glaſs; and thoſe of Bean-Stalks, Coleworts, Brambles, Ruſhes, and many other Plants may be uſed for the ſame Purpoſe.—As to Stone, the other Ingredient in Glaſs, the beſt is that which will eaſily melt, is white, and tranſparent; and this is found principally in *Italy*, being a Sort of Marble, call'd *Tarſo*. Nothing indeed makes finer and clearer Glaſs than Flint, but it is ſeldom uſed becauſe of the Charge of preparing it. The Preparation neceſſary for Stone is to calcine, powder, and ſift it; but where proper Stone cannot be had, Sand is uſed, which is to be well waſh'd, and needs no other Preparation. Our Glaſs-Houſes are furniſh'd with white Sand for their cryſtal Glaſſes from *Maidſtone*, and with a coarſer Sand for green Glaſs from *Woolwich*.

taken out of the Pots, to the Caſting-Table. Such is the Violence of the Fire, that the Furnaces are repair'd every ſix Months, and ſeldom laſt longer than three Years, being then rebuilt from top to bottom.—When the Furnace is heated to a proper Degree, they fill the Pots with Materials, which is done at ſeveral times to facilitate the Fuſion; and when the Matter is melted, ſettled, and refined, which is commonly in four and twenty Hours, they fill the Ciſterns with it in the ſame Furnace, where they let them remain about ſix Hours longer, till they appear all white with the exceſſive Heat. By means of Pullies and a large Iron Chain the Ciſterns are raiſed out of the Furnace, and placed upon a Sort of Carriage, whereby they are conducted to the Table where the Glaſs is to be run. This Table or Mould is of Pot-Metal, about nine Feet long, and broad in Proportion, having Iron Rims or Rulers on the Edges of it, which being moveable, ſo as to be ſet cloſer or further apart at pleaſure, determine the Width of the Glaſſes. Upon theſe Rulers reſt the Extremities of a braſs Roller, by means of which the burning Liquid, when pour'd upon the Table from the Ciſtern, is equally ſpread from one End to the other, and render'd of an uniform Thickneſs. When the Glaſs is come to a proper Conſiſtence, they ſhove it off into the annealing Furnace, and ſo continue caſting other Plates till the Pots of Metal are exhauſted; removing the Table from one annealing Furnace to another, as faſt as they are fill'd, where the Plates remain ten Days or longer, and by the gradual Decreaſe of the Heat they are equally conſolidated in every Part. It is really ſurprizing to behold with what Quickneſs and Addreſs the Workmen go through this dangerous Buſineſs, how they raiſe the Ciſterns full of flaming Matter out of the Furnace, convey them to the Table, pour out the fiery Torrent, ſpread the Glaſs, *&c.* In ſhort, the Whole is inconceiveable to ſuch as have not been Eye-Witneſſes of this wonderful Manufacture.

THEIR Manner of heating the Furnaces is ſo ſingular that it deſerves to be mention'd. The Perſon employ'd in doing it runs round the Furnace as faſt as he is able, and throwing into each Aperture, as he goes along, a Billet or Piece of Wood cut for that Purpoſe; and this Courſe he continues for a certain Number of Hours, at the End of which he is relieved by another. This conſtant and regular Supply of Fuel keeps the Furnace to a proper Degree of Heat, which is ſuch, that a large Bar of Iron laid at one of its Mouths becomes red-hot in leſs than half a Minute*.—It is computed that one of the Melting-Furnaces, before it is fit to run Glaſs, coſts above three thouſand five hundred Pounds; that three Months are required to repair it, and ſix at leaſt to build it anew; and that when a Pot of Metal burſts in the Furnace, the Loſs of Matter and Time is more than two hundred and fifty Pounds.

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* Of all the Effects of Fire on natural Bodies, that of changing them into Glaſs is one of the moſt ſurprizing. The Chymiſts hold, that there is no Body but may be vitrified, *i. e.* converted into Glaſs; even Gold itſelf may be ſo changed by the intenſe Heat of the Sun's Rays collected in a large Burning-Glaſs. And as Vitrification is the Effect of Fire, ſo it is the laſt Effect;

As we are now ſpeaking of Glaſs, it may not be amiſs to take notice of one of its moſt remarkable Properties, *viz.* its *Ductility*; for it may be drawn or ſpun out into long Threads, to a Degree of Fineneſs almoſt incredible. We have of them in the Plumes of Childrens Caps, and divers other Works, much finer than any Hair, and which bend and wave with every Breath of Wind. In the ſpinning of Glaſs two Operators are employ'd, one of whom holds the melted Metal over a Lamp, from which the other draws a Thread with a Hook, and having faſten'd it on the Rim of a Wheel, he turns it ſwiftly round till he has ſpun out the Maſs from whence the Thread is drawn. Thus this brittle Matter becomes ſurprizingly flexible, which is always in Proportion to its Fineneſs; and the Threads of Glaſs may be ſpun as ſmall

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its utmoſt Force not being able to carry the Change of a Body any farther. Whence Dr. *Merret* mentions it as a merry Saying of a great Artiſt in the Buſineſs of Glaſs, That their Profeſſion would be the laſt in the World; for that when the Univerſe ſhould be conſumed by Fire, all Things therein would be turn'd to Glaſs.

as that of a Silk-Worm, or even thoſe of a Spider's Web.

THIS naturally leads us to conſider the amazing Ductility of Gold, which exceeds that of all other Bodies, of which the Gold-Beaters and Gold-Wire-Drawers furniſh us with abundant Proof, and perhaps none are more curious in theſe Works than the *French* Artificers, or have made nicer Obſervations on this Subject than the Philoſophers of that Nation.—A Gold-Beater, having melted a Quantity of fine Gold, beats it on his Anvil into a Plate as thin as Paper, and then cuts it with his Sheers into little Pieces about an Inch ſquare. Theſe he puts between the Leaves of a Sort of Book made of Vellum, and with a Hammer beats them on a Marble Block, till they are ſtretched out nearly to the Size of the Book. He then takes them out, cuts them in four, and puts them into another Book to be farther extended. When they are brought to a certain Degree of Fineneſs in the two firſt Books, they are again cut into four, and made to undergo the ſame Hammering in two others, which, as well as the former, are call'd Moulds; but the Leaves of theſe, inſtead of Vellum, are made of Ox-Guts well ſcour'd and prepared for that Purpoſe. The Leaves of Gold being beaten to the Thinneſs required, which is greater or leſs according to the Uſe it is intended for, are diſpoſed in little Paper-Books prepared with red Bole for the Gold to ſtick to, and thus are kept for Sale.—By this Operation an Ounce of Gold is beat into a Surface of 146 ſquare Feet; and it has been computed, that the thinneſt Parts of ſome Gold-Leaves are ſcarce one 360,000th Part of an Inch thick.

BUT the Diſtenſion of Gold under the Hammer (how conſiderable ſoever) is far ſhort of what it undergoes in the Drawing-Iron. What we call Gold-Wire is made of a cylindrical Ingot of Silver, uſually about two Feet long, and two or three Inches round, which being cover'd with Leaf-Gold is ſucceſſively drawn through the Holes of ſeveral Irons, each ſmaller and ſmaller, till it be as fine or finer than a Hair of the Head. The Ingot paſſes through a hundred and forty or fifty Holes before it is brought to its utmoſt Fineneſs, every new Hole leſſening its Diameter; but then it gains in Length what it loſes in Thickneſs, and conſequently increaſes in Surface; yet the thin Covering of Gold ſtill follows the Silver in all its Extenſion, and never leaves the minuteſt Part bare, even to the Microſcope. M. *Reaumur*, who has been very curious in his Calculations relating to the Ductility of Gold *, obſerves, that an Ingot or Roll of Silver weighing thirty Pounds, about an Inch and a half in Diameter and twenty-two Inches long, is uſually cover'd over by the Wire-Drawers with two Ounces of Leaf-Gold, and ſometimes with little more than one; ſo that the Thickneſs of the Gold ſeldom exceeds a five-hundredth Part of an Inch, and ſometimes not a thouſandth. The ſame ingenious Gentleman found, by exact weighing and the moſt accurate Computation, that an Ounce of the fine Wire drawn from ſuch an Ingot cover'd with two Ounces of Gold, was 3232 Feet long, and conſequently the whole Ingot 1,163,520 Feet, *Paris* Meaſure, which are equal to 1,264,400 *Engliſh* Feet, or 240 Miles. But this is not all; for the greateſt Part of our Gold-Wire is ſpun or wound on Silk, in order to which it is preſs'd flat between two Rollers of well-poliſh'd Steel, and by this Preſſure it is lengthen'd above one Seventh; ſo that inſtead of 240 Miles we may now reckon 274. The Breadth of this thin *Lamina*, or flatted Wire, is a 96th Part of an Inch; and by Calculation it appears, that the Ounce of Gold is thus ſpread into a Surface of 1190 ſquare Feet, whereas by the Gold-Beater's Hammer it is only extended to 146, as before obſerved.—How inconceivably

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* *Merſenne*, *Furetiere*, *Rohault*, Dr. *Halley*, and others, have likewiſe made Calculations on this Subject, but M. *Reaumur* ſeems to have carried the Matter to the greateſt Length. Dr. *Halley* computed, that two Yards of ſuperfine Wire weigh'd a Grain, and that ninety-eight Yards of it were cover'd by a ſingle Grain of Gold. The Diameter of ſuch Wire he found to be one 386th Part

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of an Inch, and that the Thickneſs of the Gold was not above the 134,500th Part of an Inch; but this is far ſhort of M. *Reaumur*'s Computation, as the Reader will obſerve.

thin muſt the Gold be in this prodigious Extenſion! M. *Reaumur* found it to be one 2,100,000th Part of an Inch; but this Computation ſuppoſes the Thickneſs of the Gold to be every where equal, which is not the Caſe, for the Leaves being thinner in ſome Places than others, the Gilding on the Wire will be ſo likewiſe; and therefore that Gentleman computes the Gold, where thinneſt, to be only one 3,150,000th Part of an Inch. Yet this is not the utmoſt Ductility that Gold is capable of; for if inſtead of two Ounces to the Ingot (upon which this Computation is founded) one only were uſed, the Thickneſs of the Gold would then be no more than the 6,300,000th Part of an Inch in the thinneſt Places. As amazing as this appears, the Gold may ſtill be reduced to much more exceſſive Thinneſs by repeating the Preſſure between the Steel-Rollers, and yet remain a perfect Covering for the Silver, ſo that the beſt Eye, even aſſiſted by the beſt Microſcope (as we have obſerv'd above) cannot diſcern the leaſt Chaſm or Diſcontinuity.

BEFORE we take Leave of *France*, we ought to give ſome Account of the *Sea-Salt* made in that Country, which yields a vaſt Revenue to the King*, and is a very conſiderable Article of its Commerce, more being made there than in all *Europe*, or perhaps in all the World beſides. There are two Kinds of this Salt; the one, which receives its Conſiſtence from the Heat of the Sun, call'd *Bay Salt* from its browniſh Colour; the other call'd *White Salt*, which is boil'd over a Furnace. The firſt Manner of Preparation is uſed where the Sea-Coaſt is flat and low, the latter where it riſes in Downs or Hills of Sand. The moſt noted Coaſts for Bay Salt are thoſe of *Britany*, *Saintonge*, and *Aunis*, eſpecially the firſt, there being reckon'd in the Bay of *Bourgneuf* alone above twenty thouſand Salt-Works. The White Salt is made chiefly on the Coaſts of *Normandy*.--The Manner of making Bay Salt is by letting the Sea-Water into ſeveral ſquare Pits or Baſons, the Bottoms whereof are well ramm'd, and which have a Communication with each other by little Channels, through which the Water is admitted to the Height of five or ſix Inches, after having reſted two or

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* The *Gabelle* or Duty on Salt is ſaid to have had its Riſe in *France* in 1286, under *Philip the Fair*; after which it was from time to time augmented by ſucceeding Princes, till at length *Philip* of *Valois* eſtabliſh'd

Granaries and Officers of the *Gabelles*, prohibiting all other Perſons from ſelling Salt: And ſince this the whole Commerce of Salt, for the inland Conſumption, has lain wholly in the King's Hands, who ſells it by his Farmers and Officers created for that Purpoſe. When the Proprietors of the Salt-Works have deliver'd to theſe Officers the Quantity they are obliged to do, they ſell the reſt to Foreigners, particularly the Northern Nations. It is computed that the Impoſts on Salt makes one Fourth of the Revenue of the Kingdom, and yields the Crown more than the King of *Spain* receives from all the rich Mines of his *American* Dominions.

three Days in larger and deeper Reſervoirs; and then the Sluices being ſhut, the Work is left to the Wind and Sun. The Seaſon for this Buſineſs is uſually from the Middle of *May* to the End of *Auguſt*, when the Sun's Rays being ſtrongeſt, the Salt is beſt raiſed and cryſtallized. The Water at firſt thickens imperceptibly, and at length becomes cover'd with a thin Cruſt, which hardening by the Continuance of the Heat is wholly converted into Salt. This Cruſt they break with Poles or Rakes, and the Flakes of Salt fall to the Bottom of the Water, which is then found to be exceeding hot. The Flakes being raked out are left for ſome Time in Heaps about the Edge of the Pit, till they are compleatly dry and fit to be pulverized. And this brown Salt is uſually ſold without any farther Preparation, though indeed in ſome Places they make it white by refining, that is, by boiling it in large Cauldrons. But the White Salt of *Normandy* is not made by refining the Bay Salt, being extracted from a muddy Sand on the Flats of the Shore, which the Tide every Day covers and impregnates with its Waters. This Sand is gather'd and remov'd into Pits, where the Water drains from it through Straw laid at the Bottom, and runs into Veſſels ſet to receive it. Of this Water the Salt is made by boiling it, after which they let it ſtand in Baſkets to purify, where it drains itſelf of the Moiſture that remain'd, and when dry is carried to the Magazines.

GREAT Quantities of Sea-Salt are exported from *France* in Time of Peace by the *Engliſh* and *Dutch*, who, when at War with the *French*, endeavour to ſupply themſelves from *Spain* and *Portugal*; but the Salts of theſe Countries have a diſagreeable Sharpneſs, and are not ſo fit for ſalting Fleſh or Fiſh as thoſe of *France*, unleſs they are ſoften'd and corrected. The Salt of *Guerande* in *Britany* is preferr'd by the *Engliſh* as the beſt and whiteſt; but that of *Bourgneuf*, though browner and heavier, is moſt uſed in *France*, and alſo throughout the *Baltic*, particularly in *Poland*, where they uſe it to manure the Ground, which it warms, and preſerves the Grain from being gnaw'd by Vermin*.

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* The Matters uſed for Manure are various in various Countries; the moſt common are Dung, Lime, and Marle. In the South-Weſt Part of *Devonſhire* they manure their Land with a brackiſh Sea-Sand, which, according to Dr. *Bury* quickens dead Land, ſo that what would otherwiſe be the barrenneſs Part of the Country is now the richeſt. The Sea-Salt, he obſerves, is too ſtrong and active of itſelf, but does very well when mingled with Lime. *Glauber* directs the Mixture to be made up with Water, and burnt like Bricks for about two Hours; which Compoſt, he ſays, will enrich the pooreſt Land. It has been obſerv'd that the Ground about *Nantwich*, where Salt or Brine is ſpilt, when dug up is an excellent Manure for Paſture Land; and even Bricks thoroughly tinged with it diſſolve and fertilize the Land very conſiderably. In ſome Parts of *Ireland* they uſe Sea-Shells, as thoſe of Cockles, Periwinkles, &c. which are found to agree well with heathy, clayey, and boggy Land; and the Shells being hard melt away

OF all the Works undertaken by the *French*, or by any other Nation, for the Advantage of Trade and Navigation, there is none more ſurprizing than the Royal Canal of *Languedoc*, which is above a hundred Miles in Length, and was cut in the laſt Century with prodigious Expence and Labour, to make a Communication between the *Ocean* and the *Mediterranean*, ſo that Merchandize might be tranſported from one Sea to the other, without the Neceſſity of ſailing round the Coaſts of *Spain* and *Portugal* through the Streights of *Gibraltar*. This was a Convenience much wiſh'd for, and the Deſign was ſeveral times thought of in the Reigns of *Charles the Great*, *Francis* I, and *Henry* IV, but was never put in Execution till the Reign of *Lewis* XIV. M. *Riquet*, an excellent Engineer, had the Direction of this great Work, which was begun in 1666, and finiſh'd in 1681. By ſurveying the Ground it was obſerved, that the Hill of *Narouſe* was the propereſt Place to make a Baſon or Reſervoir of Water, which was to be convey'd by one Channel towards the *Mediterranean*, and by another towards *Toulouſe*, where the River *Garonne* begins to be navigable. This Spot of Ground is ſix hundred Feet higher than the Level of the two Seas, but there being only one Spring near it,

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ſlowly, ſo that the Manure need not be repeated for twenty or thirty Years. Theſe Shells have been likewiſe uſed in the Flower-Garden with great Succeſs.

and

BIBLIOTHECA BODLEIANA

and that very inſufficient to furniſh a requiſite Body of Water for the Purpoſe, M. *Riquet* form'd a vaſt Reſervoir among the neighbouring Mountains, from whence the Water is brought by an Aqueduct to the Baſon of *Narouſe*, which is 1200 Feet long and 900 broad, and thus never fails of a Supply in the drieſt Summers. From this Baſon the Canal runs Eaſtward to the Port of *Cette* in the *Mediterranean*, and Weſtward to the City of *Toulouſe*, where it joins the *Garonne*, which River falls into the Ocean in the Bay of *Biſcay*.

IN the Execution of this Work prodigious Difficulties were ſurmounted, the Unevenneſs of the Ground, the Mountains, Rivers and Brooks which croſs'd the Way, ſeeming to render it utterly impracticable. In ſome Places the Canal is carried over Vallies and Rivers by lofty Aqueducts, and in others they have cut a Paſſage for it through Rocks and Mountains. Above a hundred Sluices have been contrived, by which the Water is confined, and the Veſſels thereby raiſed from one Height to another in a ſurprizing Manner. Theſe Sluices conſiſt of thick Walls running parallel to each other, at the Diſtance of about thirty Feet, with ſtrong Gates at each End to let the Water in and out as there is Occaſion. To give the Reader an Idea of their Uſe, let us ſuppoſe a Bark to enter the Canal from the *Mediterranean*, and having ſail'd through that Part of it which runs along the Plain, to arrive at the Foot of one theſe Sluices. Immediately the Gates are open'd, and the Water ruſhing out forms one common Level with that which is below. The Veſſel being drawn in, the Gates are ſhut again, and the upper ones being open'd the Water flows in and riſes by Degrees, till the Bark is mounted conſiderably higher than it was before. Then proceeding to the ſecond Sluice it aſcends in the ſame Manner, and ſo from one to another till it arrives at the Baſon of *Narouſe* above-mention'd, from whence it is convey'd down to *Toulouſe* by the ſame Sort of Locks or Sluices. —We may eaſily conceive what vaſt Sums this Canal muſt have coſt before it was compleated, and what a conſtant Charge muſt attend the keeping it in Repair; and yet we do not find that it ſufficiently anſwers the Purpoſe for which it was intended, the great Number of Sluices rendering the Navigation of it both tedious and expenſive.

THERE are other Works of this Kind in *France*, which, by uniting the navigable Rivers, are of great Advantage to the Inland Trade of the Kingdom. The Canals of *Briare* and *Orleans*, next to that of *Languedoc*, are the moſt remarkable, having ſeveral Sluices like thoſe already deſcribed. By theſe Canals a Communication is open'd between the *Seine* and the *Loire*, whereby *Paris* is eaſily furniſh'd with the Productions of the interior Parts of the Kingdom, as well as the Merchandiſe of *Nantes* in *Britany*, and a reciprocal Traffick carried on between the Northern and Southern Provinces.

HAVING mention'd *Nantes*, it ſeems proper to take notice of its excellent Brandy*, eſpecially as that Liquor makes no inconſiderable Article in the *French* Commerce. The Brandies of *Nantes* and *Cognac* are eſteem'd the beſt in *France*, being of a better Flavour, finer and ſtronger, and enduring the Bubble-Proof longer than any of the reſt†. A great Number of foreign Veſſels return from the Ports of *France* chiefly laden with Brandy, though the *Dutch* take off almoſt as much as all the reſt of *Europe*. It is computed that near 200,000 Gallons are annually exported from the City of

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* Brandy is a Spirit drawn from Wine by ſimple Diſtillation, and Brandy purified by a ſecond or more Diſtillations is what we call *Spirit of Wine rectified*. The chief Uſe of Brandy is as a Drink, eſpecially in the Northern Countries of *Europe*; the Savages of *Canada* and other Parts of North *America* are extremely fond of it; and the Negroes of *Guinea* will ſell one another for a few Bottles. It is alſo of ſome Uſe in Medicine, being ſaid to ſtrengthen the Nerves; and the rectified Spirit is uſed in Dying.

† The beſt Brandy is that which is white, clear, of a good Taſte, and will bear the Teſt or Proof, *i. e.* upon pouring it into a Glaſs, a little Lather or Froth will be form'd at top of it, which as it diminiſhes makes a Circle, call'd by the *French* Merchants the *Chapelet*, and by the *Engliſh* the *Bead* or *Bubble*; there being no Brandy but what is well dephlegmated, ſo as to retain no ſuperfluous Humidity, whereon the Bead will be entirely form'd.

Nantes alone, and above twice that Number from *Bourdeaux.*—As to the Wines of *France*, their Reputation is well known, and as we have already deſcrib'd the Manner of making them, we ſhall only add, that beſides their vaſt Conſumption at home, great Quantities are exported to other Countries.

THUS we have given as full an Account of what is moſt remarkable in *France* as our Limits will permit, and now proceed over the *Pyrenees* to take a View of the Curioſities of *Spain* and *Portugal.*

CHAP. III.

Of SPAIN *and* PORTUGAL.

SPRINGS, CAVES, LAKES, &c.

SPAIN is ſeparated from *France* by a long Chain of very high Mountains call'd the *Pyrenees*, which reaches from the Bay of *Biſcay* to the *Mediterranean*; and from this Ridge ſeveral Branches extend themſelves through great Part of the Kingdom. Theſe Mountains abound with valuable Metals and Minerals, and ſend forth a vaſt Number of Springs, which form many fine Rivers that water the Plains and Valleys, and render them fertile and delightful. The Mountains of *Andaluſia*

daluſia and *Granada* are alſo remarkable for their mineral Treaſure, and for a great Variety of medicinal Waters, whoſe healing Virtues many have experienced. Of the hot Kind the moſt famous are thoſe of *Seville*, *Cordoua*, and *Granada*, which are ſaid to cure all chronical and even venereal Diſeaſes; and this is not improbable, conſidering the Minerals they are impregnated with, their exceſſive Heat, and the plentiful Perſpiration occaſion'd thereby, as well as by the Warmth of the Climate.—Nor is *Portugal* without theſe ſalutiferous Fountains, having ſome of a hot, and others of a cold Nature. One in particular of the former Kind, about forty Miles North of *Liſbon*, is much reſorted to, where an Hoſpital has been built for the Reception of poor Patients, with a Phyſician, Apothecary, Surgeon, and other Attendants. The Hot Bath of *St. Peter* in *Algarve* is alſo reckon'd of great Virtue, and ſome others in the Northern Parts of the Kingdom.

NEAR *Antequera* in *Granada* there is a Spring whoſe Water is ſaid to diſſolve the Stone in the Bladder*, and bring it away by Urine; but we may ſuppoſe this Character exceeds the Truth, though it may probably be of great Service in nephritic Diſorders, by promoting a Diſcharge of Sand or Gravel.—In the Neighbourhood of the ſame City are ſeveral remarkable Caves, ſuppoſed to be Mines formerly carried on by the *Romans*, and exhauſted of their precious Metals.—Another Rarity near *Antequera* is a Parcel of high Rocks, which at a Diſtance look like Men, Beaſts, Buildings, *&c.* and are reckon'd a wonderful Work of Nature.

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* How ineſtimable would this Water be, were it poſſeſs'd of ſo extraordinary a Quality, as thus to carry off one of the moſt terrible Diſeaſes in Nature! There is no Way of curing the Stone in the Bladder, when it is grown too large to be voided, but either by a Liquor that will diſſolve or break it, ſo that it may be evacuated piece-meal, which is call'd *Lithontriptic*; or by the Operation of Cutting, which is term'd *Lithotomy*. But (un-

ON the Top of a Ridge of Mountains in *Portugal*, call'd *Eſtrella*, there are two Lakes of a great Extent and Depth, eſpecially one of them, which is ſaid to be unfathomable. What is chiefly remarkable in them is, that they are calm when the Sea is ſo, and rough when that is ſtormy; which makes it conjectur'd they have a ſubterraneous Communication with the Ocean: And this ſeems to be confirm'd by the Pieces of Ships they now and then throw up, though almoſt forty Miles diſtant from the Sea.—There is another extraordinary Lake in this Country, which uſually before a Storm is ſaid to make a frightful rumbling Noiſe, that may be

leſs we allow Mrs. *Stephens*'s Medicine to be ſuch) we have yet no aſſured Lithontriptic known, ſo that the uſual Cure is by making an Inciſion and extracting the Stone out of the Bladder, which there are various Methods of performing. The *Engliſh* and *French* Surgeons are famous for this curious Operation.

be heard at the Diſtance of eighteen or twenty Miles.—And we are alſo told of a Pool or Fountain call'd *Fervenças*, about twenty-four Miles from *Coimbra*, that abſorbs not only Wood, but even the lighteſt Bodies thrown into it, ſuch as Cork, Straws, Feathers, *&c.* which ſink to the Bottom and are ſeen no more.—To theſe we may add a remarkable Spring near *Eſtremos*, which petrifies Wood, or rather covers it with a Caſe of Stone; but the moſt ſurprizing Circumſtance is, that it throws up Water enough in Summer to turn ſeveral Mills, whereas it is quite dried up in the Winter*.

THERE is one Particular related of the River *Guadiana*, that deſerves to be mention'd under this Article, *viz.* That about eight Leagues from its Source it entirely loſes itſelf under Ground, and, after a ſubterraneous Courſe of ſeven or eight Leagues more, riſes again in a Lake near a Village call'd *Daymiel*. From hence it takes the Name of *Guadiana*, being hitherto call'd *Ruydera*, and in its Courſe ſinks twice under Ground again before it falls into the Ocean*.

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* If we are rightly inform'd, there is an Inſtance of this Kind at *Lambourn* in *Berkſhire*, the little River that runs by it being always high in Summer, but very low or entirely loſt in Winter. Mr. *Sylveſter*, (the Tranſlator of *Dubartas*) who liv'd at *Lambourn* many Years, takes notice of it, addreſſing himſelf to the Rivulet in the following Lines:

All Summer long, while all thy Siſters ſhrink,
Then of thy Waters Thouſands daily drink;
But while the reſt are full unto the Top,
All Winter long thou doſt not ſhew a Drop.

FOSSILS.

SPAIN and *Portugal* abound with Mountains, as we have obſerved already, whoſe Bowels are furniſh'd with a vaſt Store of divers Metals and Minerals, particularly Iron, Copper, Lead, Quickſilver, Alum, and Calamine. To ſay nothing of their Quarries of Marble, of which there are ſeveral Sorts, they have Agate, Granate, Jaſper, and other precious Stones. As to their Mines of Gold and Silver, they have been either exhauſted by the *Romans*, *Carthaginians*, and other Nations, or at leaſt quite neglected by the *Spaniards*, ſince they have been able to draw ſuch vaſt Quantities of thoſe rich Metals out of their *American* Dominions. Of all the Mines in *Spain* therefore thoſe are the moſt valuable which furniſh them with Iron and Quickſilver, of both which they have great Plenty. Their Iron is excellent, particularly that which is dug out of the Mountains of *Biſcay*, whereof large Quantities are ſent to moſt Parts of *Europe*, as well as manufactur'd at home. Some ſay the *Spaniſh* Iron is the beſt in the World, but the *Swediſh* Iron has generally the Preference, becauſe the *Spaniſh* is apt to red-ſear, (as they call it) that is, to crack between hot and cold.

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* The burying itſelf under Ground, and riſing again in another Place, is not peculiar to the *Guadiana*, but likewiſe reported of the *Nile*, the *Tigris*, and many other Rivers. Nay, we need not look abroad for an Inſtance of this Nature, for the River *Mole* in *Surry* ſinks into the Earth at the Foot of *Box-Hill*, and after a ſubterraneous Paſſage of ſeveral Miles appears again at *Leatherhead*; whence Mr. *Pope*, in his *Windſor-Foreſt*, calls it

The ſullen Mole, *that hides his diving Flood.*

But ſome are of Opinion, that the River which riſes at *Leatherhead* is really a new River, diſtinct from the *Mole*, though it goes by the ſame Name; and no doubt but falſe Conjectures and Reports have been made concerning ſeveral other Rivers that loſe themſelves in the ſame Manner.

QUICKSILVER, or Mercury, is a mineral fluid Matter, cold to the Touch, of a ſhining Silver Colour, very heavy, volatile, and which will unite with moſt Metals, eſpecially Gold, to which it joins itſelf very cloſely. It is ſometimes found in its fluid Form in the Bowels of the Earth, and is then call'd *Virgin Mercury*; but it is more uſually found in Glebes, ſometimes very hard and ſtony, of a ruddy, yellow, or blackiſh Colour; or elſe in form of a red ſulphureous Mineral call'd *Cinnabar*. To ſeparate the Mercury from the Ore or Earth, the uſual Way is to grind the Glebe to Powder, mix it with Water, and ſtir it briſkly about till the Water becomes very thick and turbid. When it has ſtood a while to ſettle, they pour off the Water, ſupply its Place with freſh, and ſtir and work it as before; and this is repeated till at length the Water comes away perfectly clear, leaving the Mercury and other metallic and ſtony Matter at the Bottom of the Veſſel. To this Matter they add the Scoria of Iron, and diſtil it in large Iron Retorts, by which the Mercury is ſeparated from all the heterogeneous Parts.—But we ſhall ſay no more of Quickſilver in this Place, as we ſhall have Occaſion to ſpeak more largely of it hereafter.

THE *Agate* (which we have ſaid is found in *Spain*) is a precious Stone, partly opake, and partly tranſparent, uſually diverſified with various Colours, Veins, Spots, *&c.* which ſometimes repreſent Trees, Animals, Fruits, Flowers, and other natural Objects*. There are various Kinds of Agates, which have different Names, according to their different Colours and Degrees of Tranſparency; of which the Sardian and Sardonyx are the moſt valuable. The Agate (eſpecially the Sardian or Cornelian) has always been eſteem'd for Seals, being a Stone that no Wax will ſtick to, that graves well, and takes a fine Poliſh. Several medicinal Virtues have been aſcribed to this Stone, which ſeem to be all imaginary.

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* *De Boot* (in his *Hiſtory of Gems)* mentions an Agate, the Size of a Man's Nail, wherein a Biſhop with his Mitre was very well repreſented; but by turning it a little there appear'd the Heads of a Man and Woman.—M. *du Fay* (in the *Memoirs of the Royal Academy of Sciences)* has given us the Art of ſtaining Agates with divers beautiful Colours; and he afterwards obſerves, that the Figures and Ramifications upon theſe Stones, whether natural or artificial, may be diſcharged with *Aqua-fortis.*—Mr. *Boyle* takes notice, that Fire will purge away the Colour of Agate.

THE *Granate*, or *Garnet*, as it is commonly call'd, is a Gem of a red Colour, reſembling that of the Kernel of a Pomegranate, from whence its Name. Granates are diſtinguiſh'd into *oriental* and *occidental*; the former brought from ſeveral Parts of the *Eaſt-Indies*, the latter found in *Spain*, *Bohemia*, and *Sileſia*; of which laſt Sort thoſe of *Bohemia* are moſt valued, and by ſome preferr'd to the oriental Kind. This Stone, reduced to Powder and taken internally, is ſaid to cure Palpitations of the Heart, to reſiſt Melancholy, and ſtop Hæmorrhages; and ſome believe it has the ſame Effect if ſuſpended about the Neck.

JASPER is a precious Stone not much different from the Agate, except that it is more opake, ſofter, and does not take ſo good a Poliſh. The florid Jaſper, found in the *Pyrenees*, is uſually ſtain'd with various Colours, though ſome have only one Colour, as Red or Green; but theſe are leaſt eſteem'd. The Green ſpotted with Red is now moſt valued; in the next Place that which borders on a Purple Colour, or that of a Carnation. Almoſt the ſame Virtues are aſcrib'd to this Stone as to the Granate, and perhaps with equal Foundation.

To theſe we ſhall add another Stone (though not of the precious Kind) which is dug up in

Spain and ſeveral other Parts of the World, *viz.* the *Hæmatites*, or *Blood-Stone*, which is a ferrugineous, ponderous, hard, metallic Subſtance, of a red, blackiſh, and ſometimes an Iron Colour, and of an earthy aſtringent Taſte. Some of theſe Stones have an uneven and angular Surface, as thoſe that are found in *Spain*, which are reckon'd the beſt in *Europe*; others are cluſter'd on the Surface like Bunches of Grapes, as thoſe brought from the *Hercynian* Foreſt in *Germany*; and others are form'd like Inteſtines, or the outer Surface of the Brain, in various Convolutions. This Stone, reduced to a fine Powder, has been uſed in all Ages to ſtop Hæmorrhages, Spitting of Blood, and to dry and heal Ulcers in the Lungs. It is alſo found very effectual to promote the *Menſes*.

The *Salt-Mines* in the Mountains of *Catalonia*, belonging to the Duke of *Cardona*, one of the richeſt Grandees in *Spain*, deſerve to be mention'd under this Article. The Salt dug out of them is of four Kinds, *white*, *bay*, *red*, and *brilliant*; which are found in diſtinct Strata, one above another. The firſt is like our Sea-Salt, only it is not granulated. The ſecond is of an Iron and Slate Colour, but has moſt of the Qualities of the white. The third only differs from the reſt by the Mixture of ſome Bole or Earth, which gives it the Colour of a Roſe. And the fourth Sort, though brilliant, is tranſparent as Cryſtal, which is the proper *Sal-Gemmæ* of the Druggiſts. This laſt Kind will become red-hot in the Fire, like Iron, but eaſily diſſolves in Water; yet the Druggiſts waſh it to give it the greater Luſtre, but they take care to wipe it dry again immediately.

VEGETABLES.

BESIDES the internal Riches of the Mountains of *Spain* and *Portugal*, we may obſerve in general, that many of them are cover'd with ſtately Trees of ſeveral Sorts either for Timber or Fuel; others afford a fragrant Herbage that ſerves to feed a great Number of Sheep and Goats, and gives their Milk and Fleſh an exquiſite Reliſh; and others furniſh the curious Botaniſt with abundance of medicinal Simples, too numerous to be here deſcribed. The Vine, which grows ſo naturally in theſe warm Countries, and yields the Inhabitants ſuch Plenty of its rich Liquor that even the pooreſt People drink it, has been ſufficiently ſpoken of in the preceding Chapter. And as for their other Fruit-Trees, they have not anly all the Sorts that either grow naturally with us in *England*, or which we cultivate with ſo much Pains, but likewiſe many others which all our Art cannot bring to Perfection.

AMONGST theſe may be reckon'd the *Orange-Tree*, which grows in great Abundance oll over the Country, wearing a continual Verdure, and bearing at the ſame Time a fragrant Bloom of Flowers and a Diverſity of Fruits, ſome in their Infant-State, and others in their full Maturity. The Fruit and the Tree are too well known to need a Deſcription; but it is worth obſerving, that the Orange-Tree is one of the moſt long-liv'd Plants in Nature, ſeveral of them having been kept in Gardens between two and three hundred Years, and even then retain'd the Appearance of their youthful Vigour. The delicious Sort call'd *China Oranges* was firſt brought from *China* by the *Portugueſe*; and it is ſaid the very Tree, from whence all the *European* ones of that Kind have been propagated, is ſtill preſerved at *Liſbon*. The City of *Seville* in *Spain* gives Name to a Species of Oranges whoſe Juice has an agreeable Acidity, and is chiefly uſed in Punch and Sauces.—The *Lemon-Tree*, whoſe acid Fruit is uſed for the ſame Purpoſes as the *Seville Orange*, is likewiſe the Produce of this Country.

THE *Pomegranate-Tree*, which bears a fine medicinal Fruit, grows plentifully in *Spain* and *Portugal*, both wild and cultivated in Gardens. There are two Kinds, the one bearing Flowers only, the other both Flowers and Fruit; the Branches are a little prickly, and the Leaves reſemble thoſe of the greater Myrtle. The Flowers are incloſed in a Purple Calyx or Cup, ſhaped ſomewhat like a Bell; and the Fruit conſiſts of a great Number of angular Grains or Seeds*, incloſed within a reddiſh Pulp, and cover'd with a thick browniſh Rind. Over this grows a Sort of Crowning, of the ſame Nature with the Rind, form'd of a Production of the Calyx. In general, Pomegranates are not only agreeable to the Palate, but good for the Stomach; and the Flowers, as well as the Rind and Kernels, are of conſiderable Uſe in Medicine, being all cooling and aſtringent.

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* From the Abundance of theſe Grains or Kernels the Fruit ſeems to have receiv'd its Name, q. d. *Pomum Gra-*

THE *Almond-Tree* deſerves to be mention'd among the ſpontaneous Productions of *Spain* and *Portugal*, though not peculiar to their Soil, but frequent in *France*, *Italy*, *Barbary*, and other warm Countries. It pretty much reſembles a Peach-Tree, bloſſoms early in the Spring, and the Fruit is ripe about *Auguſt*. The Flowers are pentapetalous, *i. e.* conſiſt of five Leaves, ranged in the Roſe Manner; and the Piſtil becomes a fleſhy Fruit, containing a Seed or Kernel incloſed in a Stone, which is the Almond, and which drops out when the Fruit is arrived at Maturity. Almonds are of two Kinds, *ſweet* and *bitter*; the former of which are of a ſoft grateful Taſte, and are reputed cooling, healing, emollient, and nutritive. The Oil drawn from them by Expreſſion is a ſafe and uſeful Remedy in nephritic Pains; and in Hoarſeneſs, Coughs, Aſthmas, Phthiſics, and all Diſorders of the Breaſt, it is highly beneficial. The latter Sort are ſeldom eaten on account of their

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natum, the kernell'd Apple; and not from *Granada* in *Spain*, as ſome have imagin'd.

Bitterneſs, but afford a proper Medicine on many Occaſions, being of a ſtimulating, detergent, aperient, and diuretic Quality *.

IT would carry us too far to ſay much more of the vegetable Productions of theſe Countries; but we think it proper to take notice of an Ever-green of the Oak-Kind, which is common enough in *Spain*, (as well as in *Languedoc*) remarkable for a Sort of Huſk or Berry call'd *Kermes*, and *Scarlet Grain*, found adhering ſometimes to its Leaves, but generally to its Stem or Branches. It is of a ſpherical Figure, as large as a Pea, ſmooth, ſhining, and full of a mucilaginous Juice of a beautiful red Colour, of conſiderable Uſe in Medicine and in Dying Scarlet. After the moſt diligent Enquiries of Naturaliſts into the Production of this Grain, it is found to be the Neſt of a ſmall Inſect or Worm, which pricking the Bark or Leaf in-order to depoſit its Eggs, raiſes a little Tumor or Bliſter, which by degrees fills with a red Pulp, impregnated with the numerous Progeny of that Animalcule*. Hence, when the Berry is dried, there comes out of it a prodigious Number of little Flies, ſo minute that they are ſcarce diſcernible, inſomuch that the whole inward Subſtance ſeems converted into theſe Inſects; to prevent which, the Kermes is uſually ſteep'd in Vinegar.—The Berries are of a vinous Smell, and of a rough bitter Taſte, which indicates their corroborating Quality, and their Fitneſs to correct the aceſcent Humours. In a Word, they are cardiac, deſiccative, aſtringent, fortify the Stomach, and prevent Abortion. They yield abundance of volatile Salt, which M. *Marſigli* thinks would have a better Effect in Medicine if taken in a Liquid, than when incloſed in Conſerves and Confections, which hinder its Action.—Thus much for the Vegetables of *Spain*; let us now briefly conſider its Animals.

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* *Hoffman* very much recommends the Uſe of bitter Almonds to prevent the Generation of the Stone, for which Purpoſe he would have three or four of them eaten every Morning. It is ſcarce credible, he ſays, how beneficial they are in calculous Diſpoſitions, ſince they expel the Urine and bring away the Sand, from whence the Stone is produced, as he has found by frequent Experience. — Some eſteem them good to be taken before drinking, in order to prevent Intoxication, which is ſaid to have been the Practice of the Emperor *Claudius*: And *Plutarch* relates that a certain Phyſician, a great Drinker, uſed to take down five bitter Almonds at every Cup, to allay the Heat and Fumes of the Wine.

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* Mr. *Derham*, ſpeaking of the Nidification of Inſects, admires the wonderful Art or Faculty which ſome of thoſe ſmall Animals have, of making the Vegetation and Growth of Trees and Plants the very Means of building their little Cells or Neſts, ſuch as are the Galls and Balls found on the Leaves and Branches of divers Vegetables, as the Oak, the Willow, the Briar, and ſome others. This (he adds) is ſo far out of the Reach of any mortal Underſtanding or Power, that if we conſider the Matter, we muſt needs perceive manifeſt Deſign, and the Concurrence of ſome great and wiſe Being, that hath from the Beginning provided for the Good of the Animal.—The Manner of the Production of Galls on Oaks and other Vegetables is well deſcribed by *Malpighi* in an expreſs Treatiſe on that Subject, and his Obſervations are confirm'd by Mr *Derham*. They are occaſion'd (according to theſe ingenious Naturaliſts) by a certain Fly which makes a Puncture to the very Heart of the tender Gem or Bud, and there depoſits an Egg or more, injecting at the ſame time a Sort of venomous Liquor, by which the regular Vegetation is obſtructed, and the Sap that was to nouriſh the young Branch is diverted into the Teguments of the Bud, which by this means grow large and form a Covering for the incloſed Inſect, as they were before for the tender Branch and its Appendage. The Maggot thus impriſon'd is at length tranſform'd into a Fly, which pierces through the Incloſure, and expatiates at full Liberty in the open Air.—In the ſame Manner are the little Excreſcences produced on the Leaves of Nettles, Ground Ivy, and other Plants; the Parent-Inſect, with its ſtiff ſetaceous Tail, piercing the Rib of the Leaf,

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and laying its Egg in the very Pith or Heart of it, together with ſome proper Juice to pervert the regular Vegetation: And from theſe Balls or Tumours iſſues a beautiful Fly, when arrived to a State of Maturiry.—The *Aleppo* Galls, uſed in Dying, making Ink, *&c.* though hard as Shells, are no other than the Caſes of Inſects bred in them after the Manner above deſcribed, and which gnaw their Way out through the little Holes obſervable in the Galls. Of theſe Inſects ſee an Account in *Phil. Tranſ.* N°. 245.

ANIMALS.

UNDER this Article we have very little remarkable in *Spain* and *Portugal*, though few Countries exceed them for Plenty and Variety of Fowl both wild and tame, and their Mountains and Foreſts abound with Deer, Hares, Rabbets, Wild Boars, and other Game. The Buffalo, or Wild Bull, is alſo found in ſome mountainous Parts of *Spain*, which is a Beaſt reſembling an Ox, but longer and bigger, having large thick Horns, ſhort black Hair, and a ſmall Head*.—The *Spaniſh* Sheep, particularly thoſe about *Segovia*, are famous all over *Europe* for the Fineneſs of their Wool; and their Horſes have been always noted for their Swiftneſs and Beauty. But however excellent their Horſes may be, they have been long accuſtom'd to breed great Numbers of Mules†, which, though not ſo ſwift, are much larger and ſtronger, and are generally uſed not only to ride on, but to carry Burdens; and even their Coaches are uſually drawn by theſe Animals. They ſeem indeed to be much more fitted by Nature for travelling over the craggy and mountainous Parts of the Country, being ſo ſure-footed, that they ſeldom make a falſe Step, let the Road be ever ſo rough and difficult; and it is ſurprizing to ſee with what Eaſe and Steadineſs they will carry their Riders, or very heavy Burdens, even on the Edge of the moſt dangerous Precipice.

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* The Buffalo is very common in the *Levant*, particularly about *Smyrna* and *Conſtantinople*, and is frequently tamed and wrought as we do Oxen. What we call *Buff-Leather*, ſtrictly ſpeaking, is made of the Skin of this Creature; though the Skins of Elks, Oxen, and ſuch-like Animals, when prepared in the ſame Manner as that of the Buffalo, are likewiſe denominated *Buff*, and uſed for the ſame Purpoſes.

† Moſt People know, that the Mule is a mongrel Kind of Quadrupede, uſually generated between an Aſs and a Mare, ſometimes alſo between a Horſe and a She-Aſs; and as Mules are a Sort of Monſters, they do not propagate their Species, though *Ariſtotle*, *Varro*, *Columella*, and other ancient Writers, make mention of ſome that were prolific.

THE *Cantharides*, or *Spaniſh Flies*, as they are call'd, (though the Name of *Beetles* would be more proper) are a Kind of poiſonous Inſects, form'd of little Worms, hatch'd on Wheat, the Leaves of the Poplar, *&c.* They are kill'd by expoſing them over boiling Vinegar, after which they are dried, and will keep good a Year or two, but not longer. They are all of a golden Hue, but the beſt are thoſe which appear with different Colours, having yellow Lines running acroſs their Wings; and are to be choſen freſh, dry, and whole. They are extremely hot and corroſive, and are remarkable for affecting the Bladder and urinary Paſſages with Inflammation, exceſſive Pain, and Strangury, even when externally applied. We have Inſtances of their internal Application, with good Succeſs, in dropſical and other Caſes; but their principal Uſe is as a Veſicatory, to raiſe Bliſters on the Skin, and by that means turn off and diſcharge ſome Flux of ill Humours.

ANTIQUITIES.

AS the *Romans* were a long time Maſters of *Spain*, the Remains of their ancient Structures are to be ſeen in ſeveral Parts of the Kingdom; of which Kind perhaps there is nothing more remarkable, or preſerved more entire to this Day, than the famous Aqueduct of *Segovia*, which was built in the Time of the Emperor *Trajan*. It is of a ſurprizing Height and Length, conſiſting of two Rows of Arches one over the other, which convey Plenty of Water through the whole City, ſo as not only to ſupply the Houſes, but alſo the Fountains and other Water-Works in the Gardens of the Nobility and Gentry. It is built of very large Stones, and though it has ſtood ſo many Centuries, it is ſtill ſtrong and beautiful, and has ſeldom wanted repairing.

THERE is a magnificent Bridge over the *Tagus* at *Alcantara*, which was alſo built in the Reign of the above-mention'd Emperor. It conſiſts of no more than ſix Arches, though it is upwards of ſix hundred Feet in Length; its Height is ſaid to be two hundred Feet above the Water.

AT *Merida*, amongſt other remains of Antiquity, there is yet ſtanding great Part of a Triumphal Arch, now call'd by the Inhabitants *Arco de St. Jago.* And at *Tarragona* we ſtill diſcern the Ruins of ſome ancient *Roman* Structures, particularly of an Amphitheatre, which has furniſh'd Materials for the building a neighbouring Church. In a Word, there are ſeveral other Marks of its former Grandeur to be met with in and about the City; but perhaps it is owing to the Devaſtations of the *Moors* that we do not find ſo many Monuments of Antiquity in *Spain* as might naturally be expected. —Leaving this Subject therefore, we proceed to give ſome Account of its more modern

BUILDINGS.

AMONGST the Cathedral Churches of *Spain*, that of *Toledo* ſeems to claim the firſt Notice, being one of the nobleſt and richeſt in the Univerſe. It is all built of curious white Stone, is 384 Feet in Length, 190 in Breadth, and 107 in Height. Its lofty Roof is ſupported by eighty-eight ſtately Columns, which divide it into three ſpacious Iſles, whereof the middlemoſt is extremely grand and majeſtic. Eight large and beautiful Gates of Braſs, with magnificent Porticos, lead into this noble Fabric, which has a very high Tower, from whence there is an extenſive Proſpect over the neighbouring Country. The Choir of the High-Altar is adorn'd with the fineſt Carv'd-Work and Gilding that can poſſibly be imagined, and incloſed with coſtly Iron-Gates fix'd on Baſes of Jaſper-Stone. On each Side of the Altar is a Braſs Pulpit, ſupported by Pillars of the ſame Metal. The Choir of the Canons is incloſed in the ſame Manner, and enrich'd with the moſt curious Carvings in Wood and Jaſper. Both theſe Choirs are adorn'd on the Outſide with fine Statues in Niches, and other ornamental Imagery, repreſenting ſeveral Pieces of Scripture-Hiſtory.—As to the Chapels in this Cathedral, of which there are a great Number, it is impoſſible to deſcribe their Beauty and Riches, or the fine Monuments of the Kings, Archbiſhops, and other illuſtrious Perſons whoſe Remains are there depoſited. The principal of theſe Chapels, call'd the *Sagrario*, wherein the Treaſure of the Church is kept, is all lined with Jaſper from the Pavement to the Roof; and the Altar, which ſtands in a large Niche, is encompaſs'd with a Balluſtrade of Silver. The Image of the Virgin, as big as the Life, is alſo of Silver; and round the Altar hang a great many Lamps of the ſame Metal. Forty or fifty large Cloſets are contrived in the Wall, which are fill'd with a prodigious Quantity of Gold and Silver Veſſels and other Utenſils, ſuch as Baſons, Chalices, Croſſes, Croſiers, Mitres, *&c.* The Tabernacle, under which the Hoſt is carried in Proceſſion on particular Feſtivals, is all of Silver gilt, and of moſt exquiſite Workmanſhip. It may be taken into ſeven thouſand Pieces, and is ſo heavy that it requires thirty

Men to carry it. Within this there is a Veſſel of pure Gold, ſome of the firſt that was brought from *America*, which contains the conſecrated Bread. Here is alſo a Figure of the Virgin ſitting upon a Rock form'd of precious Stones, amongſt which is a Diamond as big as a Pigeon's Egg. In ſhort, it would require a Volume to give a particular Deſcription of this Cathedral and all the Curioſities of its Treaſury; and therefore, from what has been already ſaid, we leave the Reader to judge of what we have not Room to mention.

THE Cathedral of *Compoſtella*, dedicated to St. *Jago*, or St. *James* the Apoſtle, whom the *Spaniards* affirm to be buried in that City, is a ſtrong and magnificent Fabric, having a very lofty Cupola adorn'd with four ſtately Towers. The Tabernacle or Repoſitory over the Altar is perhaps the fineſt in the World, being ſupported by ſix Angels mounted on as many Columns; and the Effigy of the great Apoſtle is held up by four Kings of *Spain*. The Whole is of Silver gilt, of the moſt curious Workmanſhip, and enriched with all proper Ornaments. Here are ſix large Silver-Candleſticks, five Feet high, preſented by *Philip* the Third; and about thirty Silver Lamps are kept continually burning in this Church, beſides forty or fifty Wax-Tapers round the Altar.—As vaſt Numbers of Pilgrims reſort hither out of Devotion, there is a noble Hoſpital built near the Cathedral for the Reception of the Poor and

Sick, where they are treated with great Care and Humanity.

SOME are of Opinion, that the Cathedral of *Seville*, in which there is a Mixture of the *Gothic* and *Mooriſh* Taſte, has ſomething in it that looks majeſtic beyond any other in the Kingdom. It is certainly a very ſtately Edifice, being 407 Feet in Length, 270 in Breadth, and 128 in Height; and its Roof is ſupported by two double Rows of beautiful Columns. The Tower of this Church is three hundred and fifty Feet high, all built of Brick, with large Windows to give Light to the Stair-Caſe, the Aſcent of which is ſo eaſy that one may ride up it on horſeback, or even in a Chaiſe. It is terminated by a Cupola, on the Top of which is the Figure of a Woman in Braſs, that turns to point out the Wind like a Weather-cock. The Inſide of the Church is adorn'd with Statues, Paintings, Monuments, and other Decorations, which it would be endleſs to deſcribe; and therefore we ſhall only mention the magnificent Tabernacle on the high Altar, which is of maſſy Silver, weighing above ſix hundred Pounds, the very Workmanſhip whereof is ſaid to have coſt forty thouſand Ducats.

THE Cathedral of *Leon* is deſervedly admired for the Beauty and Regularity of its Architecture, and the Elegance and Variety of its Ornaments, in which Reſpect it is reckon'd the fineſt in *Spain*. This appears from the *Spaniſh* Proverb relating to the three Cathedrals beforemention'd, and this of *Leon*, which runs thus: "*Se-* " *ville* for Grandeur, *Toledo* for Riches, *Compo-* " *ſtella* for Strength, and *Leon* for curious Work- " manſhip." It is likewiſe remarkable for the Monuments of an Emperor, thirty-ſeven Kings, and other illuſtrious Perſonages there interr'd.

BUT of all the Cathedrals in *Spain*, the moſt magnificent is that of *Cordoua*, which is ſtill call'd the *Mezquita*, having been originally a Moſque, built in the eighth Century by the famous *Mooriſh* King *Abderhaman*, and may be juſtly rank'd among the Wonders of the World. It is 600 Feet in Length, and 250 in Breadth; and the Roof, which is ſurprizingly bold and lofty, and richly gilt, is ſupported by 365 Columns of fine Marble. It has twenty-four Gates, adorn'd with Sculpture; and ſome of its Chapels, of which there are upwards of three hundred, are particularly beautiful, being embelliſh'd with Gilding, Paintings, and other Ornaments.

To the ſacred Structures already mention'd let us add one more of the ſame Kind, *viz.* the Cathedral of St. *Vincent* in *Liſbon*, which is a vaſt *Gothic* Edifice, heavy and clumſy indeed, but being ſeated on a Hill it makes a noble Appearance at a proper Diſtance, when grouped with the reſt of the public Buildings. What it wants, however, in Elegance and Beauty without, is made up by the Richneſs of its Ornaments within, ſuch as Statues, Paintings, and Utenſils of Gold and Silver of exquiſite Workman-manſhip, enrich'd with precious Stones of immenſe Value.

WE now come to take a View of ſome of the Royal Palaces, and firſt of the *Eſcurial**, ſo call'd from a little Village of that Name, in the Neighbourhood of which it ſtands, about two and twenty Miles from *Madrid*. This Palace, (including the Monaſtery, Church, College, Library, and other Buildings) is not only the moſt magnificent in *Spain*, but perhaps in *Europe*, and is reckon'd by the *Spaniards* the eighth Wonder of the World. The whole Pile of Building is a vaſt Square, about three thouſand Feet in Compaſs, all of fine grey Stone dug out of a neighbouring Mountain, and ſo well poliſh'd that it looks like Marble. The Windows in the four Fronts, including thoſe in the Pavilions at each Corner, amount to upwards of eleven hundred; but thoſe within are computed at as many thouſands. The principal Front faces the Weſt, having three noble Gates, eſpecially that in the Middle, which leads to the Church, a large and beautiful Structure, built in Imitation of St. *Peter*'s at *Rome*. It is 364 Feet long, 230 broad, and of a proportionable Height. The Roof, which is finely gilt and painted, is ſupported by Columns of the *Doric* Order, dividing it into ſix ſtately Iſles, with forty-eight Chapels and Altars, beſides the grand one at the Eaſt End, which is magnificent beyond Deſcription. The Tabernacle of the great Altar is of Porphyry, wrought with the Point of a Diamond; it is made in the Form of a Cupola ſupported by eighteen Columns of Agate, and adorn'd with Gold and precious Stones. The Altar itſelf is of fine black Marble, and behind it the Wall is lined with a ſquare Piece of Porphyry wherein one may ſee the Inſide of the Church as plain as in a Looking-Glaſs. It is aſtoniſhing to behold the Sacriſty or Veſtry, fill'd with the Veſtments, Chalices, and other coſtly Veſſels and Utenſils belonging to the Church. Here are a great Number of Statues of Saints, *&c.* of excellent Workmanſhip, and ſeveral of the ſmaller Sort are of Gold and Silver. The Paintings, which are reckon'd above ſixteen hundred, are many of them large, and done by the moſt eminent Maſters. Underneath the grand Chapel is a large and beautiful Mauſoleum or Burying-Place for the Royal Family, which is call'd the *Pantheon*, being a Rotunda, built after the Manner of that Temple at *Rome*. The Deſcent to it conſiſts of more than fifty Marble Steps, and the Gate that opens into it is Braſs gilt, and of very curious Workmanſhip. The Dome is lined with Jaſper intermix'd with little Plates of Braſs, and the Pavement is likewiſe compoſed of

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* This Palace was built by *Philip* II. of *Spain*, in Memory of a Victory his Forces obtain'd over the *French* near *St. Quintin* in *Picardy*, in the Year 1557, on St. *Laurence*'s Day; to the Honour of which Saint the King had made a Vow to erect this ſtately Edifice, in caſe his Troops overcame the Enemy.

Squares of Jaſper and Marble, forming a Star in the Middle. Facing the Entrance is a Kind of Chapel or Oratory, adorn'd in the moſt ſumptuous Manner imaginable, particularly with a Crucifix enrich'd with Diamonds and other precious Stones. In the Middle of this noble Vault we ſee a large brazen Candleſtick, ſupported by Figures of Angels and the four Evangeliſts of the ſame Metal; and in twenty-ſix Niches, which are embelliſh'd with the richeſt Ornaments, are placed as many Urns or Sepulchres of black Marble, twelve or thirteen whereof are already fill'd with the deceaſed Kings and Queens of *Spain*, and the reſt wait to receive the Remains of ſucceeding Monarchs. —As to the Royal Apartments, (or what we may properly call the *Palace*) a particular Deſcription of them would carry us too far; and therefore we ſhall only obſerve, that they are large, ſtately, furniſh'd in the moſt magnificent Manner, and adorned with every thing that is rich and beautiful. Throughout the Whole we ſee a Variety of Marble, Jaſper, and other curious Stones, carved by the beſt Maſters and in the grandeſt Taſte; and all the Halls, Galleries, Stair-Caſes, *&c.* are fill'd with excellent Paintings; to ſay nothing of the fine Hangings, Plate, and other coſtly Furniture.—The Monaſtery (in which there are two hundred Religious Monks of the Order of St. *Jerom*) conſiſts of five Courts or Squares, one larger than the reſt, each of them adorn'd with a Mara Marble-Fountain. The grand Cloiſter, which is two hundred and ten Feet ſquare, is paved with black and white Marble, as are likewiſe the Walks of the Garden within in; and at the Bottom of it is a beautiful Chapel in form of a Dome, open on all Sides, and ſupported by Marble Columns. The Refectory, or Hall where the Religious take their Meals, is very long, and adorn'd with fine Paintings, amongſt which there is one repreſenting *Charles* V. and *Philip* II. carried to Heaven by Angels. There are ſeveral Infirmaries for the Sick belonging to this Monaſtery, two grand Apartments to entertain Strangers, nine Kitchens, above forty Rooms under Ground for Offices of divers Kinds, and eleven vaſt Ciſterns, that will hold two hundred Tons of Water.—The *College*, where a Number of young Students are maintain'd at the King's Expence, is a very handſome Building; and the Library is in all Reſpects anſwerable to the reſt of this noble and ſurprizing Edifice. It contains a fine Collection of Books in all Languages and Faculties, both printed and manuſcript, diſpoſed in a very elegant Manner, the Stands or Shelves being neatly carved, and made of the choiceſt Sort of Wood in *Spain* or the *Indies*. The Floor is beautifully paved with Marble, and the Cieling is adorn'd with admirable Paintings repreſenting the Liberal Arts and Sciences. The Books, which are about 100,000, are placed in five Galleries one above another, all finely painted by *Titian* and other celebrated Maſters.—But it is time to conclude, for to deſcribe every Particular in the *Eſcurial* as it deſerves would fill a Volume*, and we have already exceeded our narrow Limits.

THE Palace of *Aranjuez*, about thirty Miles South of *Madrid*, though much inferior to the *Eſcurial* in Bigneſs and Elegancy of Structure, yet far exceeds it for delightful Gardens and Water-Works, which are here in the higheſt Perfection. It is ſituated in an Iſland form'd by the Conflex of the *Tagus* and the *Xarama*, and a large Canal cut from one River to another. A handſome Terrace runs round the Gardens, which are ſo well ſupplied with Water from the *Tagus*, that they are never ſcorch'd with the Sun's Heat, but kept in a conſtant Bloom and beautiful Verdure. In a Word, the great Number of fine Fountains, Grottos, Caſcades, ſhady Walks, Summer-houſes, *&c.* render this Palace the moſt charming of any in the Kingdom, though the *Eſcurial* is moſt frequented by the Royal Family.

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* The Deſcription of the *Eſcurial* by F. *Franciſco de los Santos* actually makes a large Folio; and to give the Reader ſome Idea of the ſurprizing Grandeur of this Palace, it is worth obſerving, that, according to that Author's Computation, it would take up more than four Days to go through all its Rooms and Apartments, the Length of the Way being reckon'd thirty-three *Spaniſh* Leagues, which is above a hundred and twenty *Engliſh* Miles.—We may judge farther of this by what *Alvarez de Colmenar* tells us in his *Delices de l'Eſpagne*, viz. that there are fourteen thouſand Doors belonging to this Palace, and eleven thouſand Windows.

HIS Catholic Majeſty's Palace at *Madrid* is a ſpacious and magnificent Edifice, conſiſting of ſeveral Courts, with Piazzas round them, and a great many gilt Balconies, which make a pretty Appearance. The Royal Apartments are very richly furniſh'd, and adorn'd with fine Tapeſtries, Paintings, Buſts, Statues, *&c.* too many to be deſcribed or enumerated.—Juſt without the Town, upon the Declivity of a Hill, the King has another ſtately and pleaſant Palace, call'd *El Buen Retiro*, or *the Good Retreat*, being his uſual Retirement in the Heat of Summer, or when wearied with the Hurry of the Court and City. It conſiſts of a ſpacious Square, flank'd with Pavilions at each Corner, having a Parterre and a beautiful Fountain in the Middle of it. The Apartments are large and magnificent, furniſh'd in the moſt elegant and coſtly Manner, and embelliſh'd with exquiſite Paintings and other Ornaments. As for the Park and Gardens, they are a perfect Paradiſe, having fine ſhady Walks, Canals, Grottos, Fountains, Statues, and all the pleaſing Variety that Art and Nature can produce, to form a delightful Retirement.

THOUGH we have dwelt ſo long upon this Subject, we muſt not leave it without taking ſome Notice of an ancient Caſtle or Palace at *Granada*, built by the *Mooriſh* Kings, which is ſtill kept in good Repair, and juſtly eſteem'd a

Wonder for its Largeneſs and Magnificence. In the Way to it we paſs by a Palace of a more modern Date, built by ſome of the Kings of *Spain*, but never quite finiſh'd, and now neglected and running to decay. The *Mooriſh* Palace appears like a Citadel, being ſurrounded with a ſtrong Wall fortified with Towers and Baſtions, and is large enough to receive a Garriſon of forty thouſand Men. We firſt enter into a grand Court paved with Marble, which has a Fountain at each Corner, and a fine Canal of Spring-Water in the Middle of it, from whence it is convey'd by Pipes into the Halls and Chambers of the Palace. The whole Building is of Free-ſtone, but the Inſide of the Walls are lined with Marble, Jaſper, and Porphyry; the Cielings of the Rooms are many of them gilt, and throughout the Palace we meet with hieroglyphical Figures and Inſcriptions. But the moſt beautiful Part of this Royal Edifice is a ſpacious Square call'd *El Quadro de los Leones*, which has a fine Stone Gallery running round it, ſupported by a hundred and ſeventeen Columns of white Marble. In the Middle of the Square is a noble Fountain, where a large Marble Baſon is ſupported by twelve Figures of Lyons, which throw Water out of their Mouths inceſſantly. The Park and Gardens, which lie on the Declivity of the Hill on which this Palace is ſituated, are very delightful; and the whole Structure is a ſufficient Monument of the Grandeur of the *Mooriſh* Princes.

THE Royal Palace at *Liſbon* deſerves to be mention'd among the reſt, not only as a beautiful and ſtately Fabric, but on account of its pleaſant Situation, having a charming Proſpect over the River *Tagus**, where it is ſo deep, that the largeſt Ships can anchor before the Windows of the Palace. The Apartments are well diſpoſed, very richly furniſh'd, and adorn'd with fine Tapeſtry, Paintings, and other Decorations.

To conclude this Article, we ſhall juſt take notice of ſome of the moſt remarkable Bridges in *Spain*; and firſt that over the *Guadiana* at *Badajoz*, which is a ſtately Fabric of Stone, conſiſting of thirty Arches, and above five hundred Yards in Length.—At *Saragoſſa* there are two noble Bridges over the *Ebro*, the one of Stone, the other of Wood, which latter is reckon'd the fineſt of the Kind in *Europe*.—Nor muſt we forget the magnificent Bridge over the *Manzanarez* at *Madrid*, built by *Philip* the Second, which is very long and lofty†.—To theſe we may add the fine Bridge over the *Mondego* at *Coimbra* in *Portugal*, conſiſting of a double Range of Arches one above another: And many more might be mention'd, but the Detail would be dry and tedious.

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* This River has been long famous for its golden Sands, or ſmall Particles of Gold mix'd amongſt them, as we learn from *Ovid*, *Mela*, *Pliny*, and other ancient Writers; and it is ſaid the Kings of *Portugal* have a Scepter made of that Gold, than which no purer is to be found in the World.

† As the *Manzanarez* is a ſmall River, and almoſt dry in Summer, it gave Occaſion to a pleaſant Saying of a certain Ambaſſador, who ſaw it at that Seaſon, That *they ſhould either buy Water, or ſell the Bridge*.—However the River does not always appear ſo deſpicable, being ſometimes very much ſwell'd by Rains or melted Snows falling from the Mountains.

ARTS, MANUFACTURES, &c.

THOUGH moſt of the *Spaniſh* Wool is ſent abroad unwrought, yet it muſt be acknowledged that the Woollen Manufactory at *Segovia* is very conſiderable, and the Cloth made there is reckon'd the fineſt in *Europe*. At *Toledo*, *Granada*, and ſome other Places, they weave Taffeties, Damaſks, and Velvets, but none of the beſt; though a vaſt Number of Hands are employ'd in the Silk Manufacture in ſeveral Parts of the Kingdom. The Quantity of Silk produced in *Spain* is almoſt incredible; for we are told that in the Neighbourhod of *Murcia* only they have ſuch Plenty of Mulberry-Trees, and feed ſuch Numbers of Silk-Worms, as yield them annually 200,000 Pound Weight of that valuable Commodity.

IN the Province of *Biſcay* they manufacture great Quantities of Iron, whole Towns (like our *Birmingham* and *Sheffield)* being fill'd with Smiths, Cutlers, and other Mechanics, employ'd in various Works of Iron and Steel, eſpecially in making Swords and Fire-Arms, for which they are particularly famous.—The City of *Cordoua* in *Andaluſia* is noted for a curious Sort of Leather, in great Requeſt there as well as in other Countries*.

IT is hardly to be conceived what vaſt Quantities of Wine and Oil are made in *Spain* and *Portugal*, which (together with their Raiſins, Oranges, Lemons, and other Fruits) are chiefly taken off by *England* and *Holland*. The moſt noted *Spaniſh* Wines are thoſe of *Galicia*, *Alicant*, *Malaga*, *Barcelona*, and *Xeres de la Frontera*, in which laſt City and its Neighbourhood 'tis ſaid they make every Year about 60,000 Pipes of that generous Wine from thence call'd *Sherry*. But the greateſt Part of the Wine conſumed in *England* is brought from *Oporto* in *Portugal*; and this indeed may be reckon'd the beſt Commodity of that Kingdom, their Oil and Fruits, as well as their Manufactures, being inferior to thoſe of *Spain*. Great Quantities of Salt are continually exported from *Setubal* or *St. Ubes* by the *Dutch* and other Nations: And the Salt-Mines of *Catalonia* yield a conſiderable Revenue to the Duke of *Cardona*, to whom they belong.

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* The Leather brought from this City we call *Cordouan* or *Cordovan*, which being formerly uſed for the Upper-Leathers of Shoes, it is probable the Term *Cordwainers*, by which our Statutes denominate Shoemakers, was thence derived; eſpecially as the *French* Workmen, who prepare that Sort of Leather, are ſtill call'd *Cordouanniers*. — But ſome derive the French *Cordonnier* (Shoemaker) and our *Cordwainer* from *Corde*, a Rope, becauſe Shoes were anciently made of Cordage, as they ſtill are in ſome Parts of *Spain*.

AT *Eſtremos* in *Portugal* there is a curious Manufacture of red earthen Ware, formerly admired in *England*, but rather as an Ornament to mix among China, than for any other Uſe. It is now quite out of Faſhion with us, but ſtill in great Vogue in *Portugal*, having an agreeable Smell. The Potters form it into Jars, Cups, Tea-pots, and a vaſt Variety of ſuch-like Utenſils.

WE have now gone through *Spain* and *Portugal*, in which Countries if the Reader has not met with ſo many curious and entertaining Particulars as he expected, we hope that *Italy*, into which we are going to introduce him, will afford him ample Satisfaction.

CHAP. IV.

Of ITALY.

MOUNTAINS, CAVES, SPRINGS, *&c.*

WE cannot enter *Italy* by Land, without croſſing over a prodigious Chain of high Mountains call'd the *Alps*, which ſeparate this Country from *France* and *Germany*; but even amongſt the perpetual Ice and Snow, and the Rocks and Precipices of theſe deſolate Regions, there is ſomething pleaſing to a curious Obſerver of the Works of Nature.

Theſe Mountains give Riſe to the *Rhine*, the *Rhone*, and many other conſiderable Rivers; ſome of which, before they get into the Plains, fall down ſteep Rocks with ſuch Violence and Noiſe, that they do not come much ſhort of the famous Cataracts of the *Nile* in *Egypt*. The River *Arva* in *Savoy* is remarkable on this Account; and the Roads near it, which are cut along the Sides of vaſt Precipices, and in ſeveral Places very narrow, with monſtrous Rocks impending over-head, and the River roaring at the Bottom, afford a Scene that few Travellers can behold without ſome Degree of Terror. But though the Proſpect of this ſtupendous Pile of rugged Mountains, inacceſſible Rocks, and wide Chaſms by which they are interſected, ſeems to carry the Face of Ruin and Confuſion, yet there is ſomething in the Whole that is auguſt and ſtately, that fills the Mind with noble Thoughts, and naturally leads us to reflect on the Power and Majeſty of the great Creator*.

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* Dr. *Derham* obſerves, that Mountains are ſo far from being a Deformity to the Earth, or a Work without Deſign, (as ſome are of Opinion) that they are a noble, uſeful, and even neceſſary Part of our Globe. As to the Buſineſs of Ornament, Beauty, and Pleaſure, he appeals to the Senſes of Mankind, whether the grateful Variety of Hills and Dales be not more pleaſing than the largeſt continued Plains. But be the Caſe as it will with Regard to Beauty, which is the leaſt valuable Conſideration, this Configuration of the Earth is

AMONGST the natural Wonders of the *Alps*, the *Glacieres*, (as they are call'd) or *Valleys of Ice*, ſeem particularly to deſerve our Notice; and a Deſcription of one of them may ſuffice to give the Reader an Idea of the reſt. But it is to be obſerv'd, that though we call them Valleys, as being vaſt Cavities or Hollows, their Situation is perhaps two or three thouſand Feet perpendicular above the Level of the Plains below, and yet having Points of Rocks and Mountains ſhooting up to a prodigious Height above them. The Aſcent to them is generally very ſteep, rugged, and ſlippery; and the Air ſo extremely cold, that Perſons who viſit them in *July* and *Auguſt*, the only Months in the Year that are fit for the Journey, go

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far the moſt commodious on ſeveral Accounts.—The Uſes of Mountains are numerous, of which we ſhall only mention a few. 1. They ſerve (ſays Mr. *Ray*) as Skreens to keep off the cold and nipping Blaſts of the Northerly and Eaſterly Winds. 2. They ſerve for the Production of different Species of Vegetables, eſpecially thoſe for medicinal Uſes. 3. It is to the Hills (as Dr. *Derham* takes notice) that Fountains chiefly owe their Riſe, and Rivers their Conveyance. The Origin of Springs indeed is much controverted and variouſly accounted for by Philoſophers; but whether they proceed from condenſed Vapours, as ſome think, or from Rains falling, as others; or are derived from the Sea by way of Attraction, Percolation, or Diſtillation; or whether all theſe Cauſes concur, or only ſome, ſtill the Mountains, whoſe vaſt Maſſes and Ridges ſerve as ſo many huge *Alembicks* or *Cola*, are the grand Agent in this noble Work of Nature.

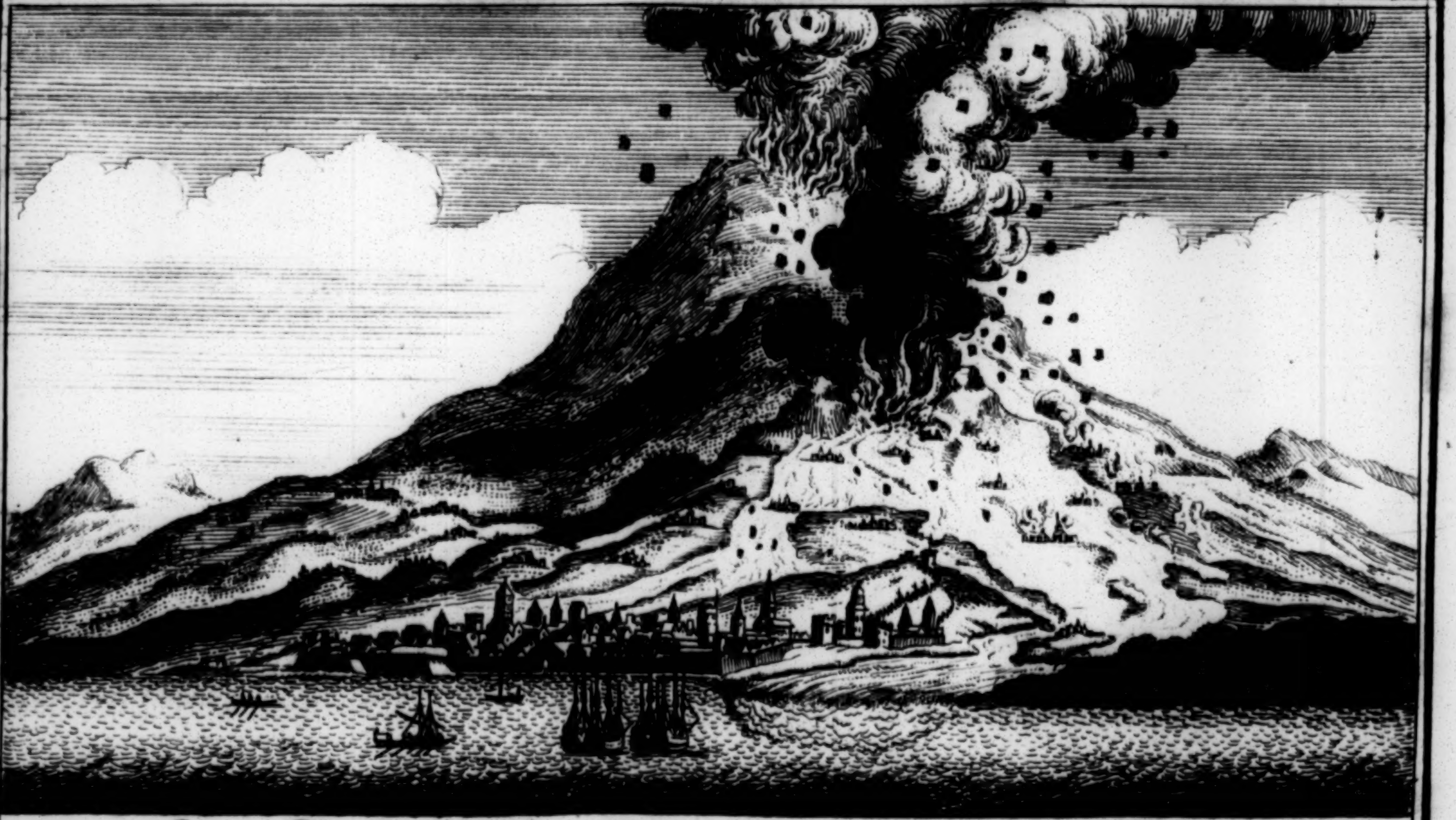
cloathed as in the Depth of Winter. One of the moſt remarkable of theſe frozen Valleys is that which takes its Name from *Chamony*, a little Village on the North Side of the *Arva*, though the Icy Valley is on the South; from whence it ſtretches itſelf near eighteen Miles in Length, being divided, at about half that Diſtance from the Village, into two different Horns or Branches. The Surface of this Valley is very uneven, appearing like a Sea or Lake that has been agitated by violent Winds and frozen all at once, whilſt the Waves were rolling and daſhing one againſt another; and in ſeveral Places there are great Cracks in the Ice, ſome narrow enough to ſtep over, but others ſome Yards wide, in which People are often loſt who go in ſearch of Cryſtal, for it is very dangerous going over them, eſpecially when cover'd with Snow. Theſe Cracks are made by the Heat of the Sun at Noon, and with ſuch a terrible Noiſe, occaſion'd by the Echo from the Rocks all round it, that it reſembles the Firing of great Guns, or loud Claps of Thunder. The Breadth of this Valley is about two Miles, and the Thickneſs of the Ice in Summer is found to be ſix or eight Feet, but ſome of the frozen Waves (if we may ſo call them) are forty or fifty Feet higher than the Cavities between them. According to Mr. *Martel*, who viſited this *Glaciere* in 1742, it has a Communication with the Valley of *Chamouny* by five Openings, at one of which the

River *Arbairon* has its Source, iſſuing from under two Arches of Ice, compoſed of a vaſt Number of vertical Shoots unequally terminated, which look like the fineſt Cryſtal in the World; and reflect an Infinity of the brighteſt Colours. The *Arbairon* is a large Stream that falls into the *Arva*, and carries along with it a great many Particles of Gold; and the Rivulet of *Argentiere*, which comes from a *Glaciere* of the ſame Name, carries with it alſo Pieces of Gold and Silver.

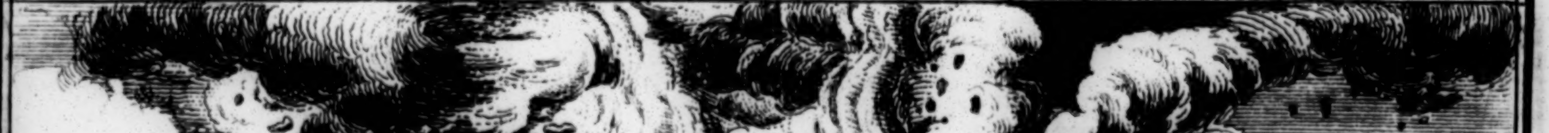
THE *Avalanches*, or Snow-Balls, which ſometimes gather and roll down the Sides of theſe Mountains, are very ſurprizing and dangerous to Travellers. They are occaſion'd by the dropping of a Quantity of Snow from ſome prominent Rock, which increaſes as it falls down the ſteep Declivities, till it becomes of a prodigious Size, and ſweeps away Houſes, Trees, Men, Horſes, or whatever it meets with in its Paſſage. As they fall ſuddenly, and with great Rapidity, it is very difficult for Paſſengers to avoid them; and nothing is able to reſiſt their Force till they get to the Bottom, where they generally break in pieces by the Violence of the Shock. Some of theſe Mountain-Snowballs have been found, by meaſuring their Track, to be above a hundred Yards in Diameter; and one of them, in the Year 1695, fell upon a Village in the Night-time, and deſtroy'd eleven Houſes, beſides Barns and Stables, burying Men, Women, and Cattle in the Ruins.

Rains. Theſe terrible Accidents (we are told) are produced even by the leaping of a Chamois, the firing of a Piſtol, a Shout, the Bells of Mules and Pack-horſes, or any Noiſe that ſhakes the Air, whereby the Snow is looſen'd from the Rocks above: For which Reaſon, in Places of the greateſt Danger, People take care to travel early, and with all the Silence poſſible. Some of theſe *Avalanches* indeed are not ſo deſtructive, which conſiſt of new-fallen Snow driven by the Wind; for theſe being lighter, Perſons buried under them may live a long time without being ſuffocated, and are often timely relieved by Men kept in Pay to clear the Roads, and give Aſſiſtance to Paſſengers on ſuch Occaſions.

AFTER this Account of the *Alps*, it would be needleſs to ſay any thing of the *Apennines*, another Chain of lofty Mountains which run through the whole Length of *Italy*; and therefore we proceed to take a View of Mount *Veſuvius*, one of the moſt famous and dreadful Volcano's in the World. This burning Mountain is ſeven or eight Miles to the Eaſtward of *Naples*, and the terrible Eruptions of Fire, Stones, and melted Matter that have proceeded from its Summit have often threaten'd the Deſtruction of that City and all the neighbouring Country. About half the Way to it from *Naples* is pleaſant enough, running through ſeveral pretty Villages along the Coaſt; after which we meet with diſmal Marks of this Volcano's



Mount Etna or Mongibello in Sicily being a true Draught of ye Eruption in 1669.



Mont Vesuvius two Leagues from Naples.

cano's Fury. The Aſcent to the Top of the Mountain is tedious and difficult, for every Step a Perſon takes he ſinks into a kind of burnt Earth, looſe and crumbled as if it had been ſifted, and mix'd with calcined Stones and Cinders. Having travell'd in this troubleſome Manner about two Miles, we arrive at a naked Plain, from ſeveral Parts whereof iſſues a ſulphureous Smoke; and in the Middle of it riſes another Hill, ſhaped like a Sugar-Loaf, of more difficult Aſcent than the former. At the Summit of this Hill is a vaſt Mouth or Cavity, about four hundred Yards in Diameter at the Top, but ſhelving down on all Sides like a Funnel, from whence proceeds a continual Smoke, and ſometimes thoſe aſtoniſhing Eruptions of Flame, Aſhes, and burning Matter, which fill the neighbouring Inhabitants with Conſternation.

IF we look into ancient Hiſtory, we find diſmal Accounts of the Devaſtations occaſion'd by this Volcano; but we need go no farther back than the laſt Century, nor even ſo far, for Inſtances of its raging with extraordinary Fury. In the Year 1694 there was a violent Eruption, which continued great Part of the Month of *April*, and threw up Aſhes, Stones, *&c.* with ſuch Force, that ſome of them reach'd *Benevento*, near thirty Miles diſtant. A prodigious Quantity of melted Minerals was likewiſe thrown out of the Mouth, and ran ſlowly down the Sides of the Mountain, inſomuch that great Numbers of Men were employ'd to cut Trenches and Channels to receive it, and prevent its ſpreading over the Plains below. At this Time, when the Wind was in the Eaſt, the Houſes and Streets of *Naples* were cover'd with Aſhes.

THE latter End of *July*, in the Year 1707, there happen'd another terrible Eruption, attended with ſuch a Rumbling and Bellowing of the Mountain, as far exceeded the Report of the largeſt Artillery. Having thrown up Clouds of Aſhes into the Air for ſeveral Days and Nights, and a Shower of Stones that kill'd both Men and Cattle, it began to belch out a liquid Torrent of Bitumen, which reſembled a gentle Stream of Fire, and cooling in its Progreſs became as hard as Flint at the Bottom, but more porous and ſpongy on the Surface. After this, frequent Flaſhes of Fire, like Lightning, proceeded from its Mouth, followed by loud Claps of Thunder; and on the ſecond of *Auguſt*, at Four in the Afternoon, there was ſuch a thick Cloud of Aſhes hovering over *Naples*, that the Darkneſs was equal to that at Midnight. The next Day, by the ſhifting of the Wind, the Aſhes were driven another Way; and the Mountain having raged after this Manner about fifteen Days, the Eruption entirely ceaſed.

To theſe Accounts of *Veſuvius* we ſhall only add a few Particulars relating to the great Eruption in 1717, as they are given us by Mr. *Edward Berkeley*, who was then at *Naples*. On the 5th of *June* (he tells us) the Mountain was obſerved to ſpue a little out of the *Crater*, as he calls its Mouth; and the ſame continued the

Day following. The 7th in the Evening it began a hideous Bellowing, which continued till Noon the next Day, cauſing the Windows and even the Houſes in *Naples* to ſhake. From that Time it would vomit vaſt Quantities of melted Matter to the South, which ſtream'd down the Side of the Mountain, like a Pot boiling over. On the 10th it roar'd and groan'd moſt dreadfully, of which one cannot form a juſter Idea than by imagining a mix'd Sound made up of the Raging of a Tempeſt, the Murmur of a troubled Sea, and the Roaring of Thunder and Artillery confuſed all together. This induced our Author, with three or four more in Company, to viſit the Mountain; and they arrived at the burning River about Midnight, when the Roaring of the Volcano was exceeding loud and horrible. There was a Mixture of Colours in the Cloud over the *Crater*, a ruddy diſmal Light in the Air over the fiery Torrent, and Aſhes were continually ſhowering upon their Heads; all which Circumſtances, augmented by the Horror and Silence of the Night, made a moſt uncommon and aſtoniſhing Scene. Imagine (ſays he) a vaſt Torrent of liquid Fire rolling along the Side of a Mountain, and with incredible Fury bearing down and conſuming Vines, Olives, Fig-trees, Houſes, and every thing that ſtood in its Way. The largeſt Stream ſeem'd half a Mile broad at leaſt, and five Miles long; and Mr. *Berkeley* walk'd ſo far up the Mountain by the Side of this burning River,

ver, that he was obliged to retire in haſte, the ſulphureous Steam having ſurprized him, and almoſt taken away his Breath. They return'd about Three in the Morning, hearing conſtantly the Murmur and Groaning of the Mountain, which now and then burſt into louder Peals, throwing up huge Spouts of Fire and burning Stones, which in their Fall reſembled the Stars in our Rockets. Sometimes there appear'd two or three diſtinct Columns of Flame, and ſometimes only a ſingle one that ſeem'd to fill the whole Crater. It was judg'd that the Flames and fiery Stones were ſhot more than a thouſand Feet perpendicular above the Summit of the Volcano; which continued raging in this Manner, more or leſs, till the 18th, when the whole Appearance ended, and the Mountain remain'd perfectly quiet.

HAVING been ſo particular in deſcribing ſeveral Eruptions of *Veſuvius*, we need ſay the leſs concerning Mount *Ætna*, another famous Volcano in the Iſland of *Sicily*, which yet muſt not be paſs'd by in Silence. There are many furious Eruptions of this Mountain recorded in Hiſtory, ſome of which have proved very fatal to its Neighbourhood; but we ſhall only take notice of that which happen'd in 1669, as it is deſcribed in the *Philoſophical Tranſactions.* It firſt broke out on the 11th of *March*, two Hours before Night, on the South-Eaſt Side of the Mountain, about twenty Miles from the old Mouth, and ten from the City of *Catanea.*

The Noiſe of the Eruption was heard a hundred Miles off, to which Diſtance the Aſhes were likewiſe carried. The Matter thrown out was a Stream of Metal and Minerals, render'd liquid by the Fierceneſs of the Fire, which boil'd up at the Mouth like Water at the Head of a great River; and having run a little Way, the Extremity thereof began to cruſt and curdle, turning into hard porous Stones call'd *Sciarri*, reſembling large Cakes of burning Sea-Coal. Theſe came rolling and tumbling one over another, bearing down any common Building by their Weight, and burning whatever was combuſtible. At firſt the Progreſs of this Inundation was at the rate of three Miles in twenty-four Hours, but afterwards it ſcarce advanced a Furlong in a Day; and thus it continued for fifteen or twenty Days together, running into the Sea cloſe by the Walls of *Catanea*. At length it made its Way over the Walls into the City, where however it did no conſiderable Damage, except to a Convent of *Benedictines*. In its Courſe it overwhelm'd fourteen Towns and Villages, containing three or four thouſand Inhabitants; and it is remarkable, that during the whole Time of this Eruption, which was fifty-four Days, neither Sun nor Stars appear'd.

BUT though *Catanea* had this time the good Fortune to eſcape the threaten'd Deſtruction, it was almoſt totally ruin'd in 1692-3 by an Earthquake, one of the moſt terrible in all Hiſtory.

It was not only felt all over *Sicily*, but likewiſe in *Naples* and *Malta*; and the Shock was ſo violent that People could not ſtand upon their Legs, and thoſe who lay upon the Ground were toſſed from Side to Side, as if upon a rolling Billow. The Earth open'd in ſeveral Places, throwing up large Quantities of Water; and great Numbers periſh'd in their Houſes by the Fall of Rocks that were looſen'd and rent from the Mountains. The Sea was violently agitated and roar'd dreadfully, Mount *Ætna* threw up vaſt Spires of Flame, and the Shock was attended with a Noiſe exceeding the loudeſt Claps of Thunder. Fifty-four Cities and Towns, with an incredible Number of Villages, were either deſtroy'd or greatly damaged; and it was computed that near 60,000 People periſhed in different Parts of the Iſland, of whom 18000 were Inhabitants of *Catanea*, very few eſcaping the general and ſudden Deſtruction of that City*. —But to return to *Italy*.

* Earthquakes are certainly the moſt formidable Phænomena in Nature, but with reſpect to their Cauſes Naturaliſts are divided, ſome aſcribing them to Water, others to Fire, and others to Air; and all of them with ſome Reaſon, though Fire ſeems to be the chief, for thoſe Countries which have the greateſt Store of Sulphur and other inflammable Matters are moſt ſubject to Earthquakes. Dr. *Liſter* is of Opinion, that the material Cauſe of Thunder, Lightning, and Earthquakes is one and the ſame, *viz.* the inflammable Breath of the Pyrites, which is a ſubſtantial Sulphur and takes

We are inform'd by Dr. *St. Clair*, in the *Philoſophical Tranſactions*, that on the Side of one of the *Apennines*, between *Florence* and *Bologna*, there is a Spot of Ground three or four Miles in Diameter, from whence iſſues a conſtant Flame, which riſes very high and gives a great Heat, but without Noiſe, Smoke, or Smell. In laſting and heavy Rains it ſometimes intermits, but rekindles with greater Heat and Vigour. The Doctor adds, that Corn grows within a few Yards of it; and he

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fire of itſelf. Dr. *Woodward*, who aſcribes Earthquakes to the ſubterraneous Heat or Fire rarefying and ſwelling the Waters of the Abyſs till it can find a Vent, obſerves, that the Effects of theſe Commotions are not very remarkable except in Countries that are mountainous, and conſequently ſtony and cavernous underneath, ſince the Fire naturally tends to thoſe Caverns where it meets with the readieſt Reception, and the Strata of Stone or Marble making great Oppoſition, the Shocks are more violent and the Effects more terrible, than when they happen amongſt Gravel, Sand, or ſuch looſe Matter as makes little Reſiſtance. Hence it is that *Italy*, *Sicily*, &c. are ſo often alarm'd and haraſs'd with Earthquakes, thoſe Countries being mountainous and cavernous, abounding with Stone and Marble, and affording Sulphur and Nitre in great Plenty.—The ſame ingenious Author adds, that *Ætna*, *Veſuvius*, and other Volcano's, are only ſo many Spiracles, ſerving to diſcharge the ſubterraneous Fire when preternaturally aſſembled; and that if this Fire can come at theſe Spiracles without any Obſtruction, it eaſily paſſes out from time to time without ſhaking or diſturbing the Earth; but when a Communication is wanting, or not ſufficiently large, it heaves and ſhakes the Earth till it has made conjectures the Flame ariſes from a Vein of Bitumen or Naphtha. There are other Fires of this Kind upon the ſame Mountains.

THE *Solfatara*, near *Pozzuoli* in the Kingdom of *Naples*, is a remarkable Hill, on which there is a Cavity of an oval Form, from ſeveral Parts whereof iſſues a thick Smoke or Steam, and ſometimes Flame. The Surface of the Ground is always very warm, and in Summer-time is cover'd with a ſaltiſh Flour or Duſt, which they ſweep together, and put into Coppers fill'd with Water, and placed over certain ſubterraneous Spiracles, the Heat where-

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its Way to the Mouth of the Volcano. He farther obſerves, there is ſcarce any Country much annoy'd with Earthquakes that has not one of theſe fiery Vents; which when an Earthquake happens is conſtantly in Flames, diſgorging that Fire, which, whilſt underneath, was the Cauſe of the Diſaſter. So that the Countries that have theſe Volcano's, though they are troubled with Earthquakes, would ſuffer much more from them if ſuch Spiracles were wanting, and the Fire ſhould continue impriſon'd in the Bowels of the Earth.—To illuſtrate the Proceſs of Nature in the Production of Earthquakes, it may not be amiſs to take notice, that artificial ones may be made by mixing twenty Pounds of Iron Filings with an equal Quantity of Sulphur, and tempering the Whole together with a little Water, ſo as to form a Maſs half dry, half moiſt. This being buried three or four Feet in the Ground will produce ſurprizing Effects in ſix or ſeven Hours time; for the Earth will begin to tremble, crack, and ſmoke, and at laſt ſend forth Fire and Flame, ſo as to reſemble (if the Quantity of Matter were ſufficient) a natural Volcano.

of, without any other Fire, evaporates the Water, and leaves an Alum behind.—It is ſaid that by an Earthquake, which happen'd in the Year 1538, a vaſt Quantity of Earth and Aſhes was thrown up from the *Solfatara*, which form'd, about three Miles from thence, a high Hill call'd *Monte Novo* or the *New Mountain*, upon the Ruins of a Town overwhelm'd by that Eruption.

WE have ſaid enough, or perhaps too much, upon the Subject of burning Mountains, and therefore proceed to deſcribe ſome of the moſt remarkable Caves or Grotto's to be found in *Italy*. About two Miles from *Naples*, juſt by the Lake of *Agnano*, is a famous little Cave call'd *Grotta del Cani*, (from the frequent Experiments made there on Dogs) the Bottom of which is cover'd with a thin ſuffocating Vapour, viſible enough to a diſcerning Eye. The Sides of the Grotto, as high as the Vapour reaches, (which is about a Foot) are of a greeniſh Colour; and above this Mark the Air is not in the leaſt offenſive or injurious: But if a Dog, or other Animal, be forcibly kept below it, the noxious Fume preſently throws him into Convulſions, and in a few Minutes ſcarce any Signs of Life appear. However, if the Creature is taken out in time, and laid in the open Air, he ſoon recovers, and ſooner if thrown into the adjacent Lake*.—This Vapour is of ſuch a Nature that Gun-powder will not take fire in it; and it extinguiſhes lighted Candles, Flambeaux, or Matches.

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* The Lake of *Agnano*, as Dr. *Mead* obſerves, has no Virtue in it more than others to produce this Effect;

NEAR the Village of *Saſſa*, about eight Miles from *Bracciano*, is another little Cave call'd *Grotta del Serpi*, or the *Grotto of Serpents*, which *Kircher* ſays is big enough to hold two Perſons, and is perforated with a great many fiſtular Apertures, almoſt like a Sieve; out of which, at the Beginning of the Spring, iſſues a vaſt Number of young Snakes of divers Colours, but not endued with any particular poiſonous Quality. In this Cave Perſons afflicted with an Elephantiaſis, Leproſy, Palſy, Gout, *&c.* are expoſed naked, where a Sweat being raiſed by the Warmth of the ſubterraneous Steams, and the Serpents clinging all round them, licking and ſucking the Parts affected, they are freed from their vicious Humours, and by continuing this Practice for ſome time the Diſtemper is entirely remov'd*. *Kircher* viſited

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but the Recovery of the Animal is owing to the Coldneſs of the Water, which promotes the Contraction of the Fibres, and ſo aſſiſts the retarded Circulation.—The Doctor is of Opinion that the Fumes of this Grotto are no real Poiſon, but act chiefly by their Gravity. Or perhaps all the Phænomena may be accounted for, as Mr. *Addiſon* ſuppoſes, by allowing the Vapour to have a glutinous or viſcous Quality.

* It is ſaid this Cave was accidentally diſcover'd by a Leper, who was going from *Rome* to ſome Baths thereabouts, and loſing his Way, and being benighted, happen'd to creep into it for a Lodging. Finding it very warm, he pull'd of his

the Grotto himſelf, found it warm, and heard a hiſſing Noiſe in the Holes; and though he did not ſee the Serpents, it not being the Seaſon of their creeping out, he ſaw ſeveral of their *Exuviæ* or Sloughs in the Grotto, and abundance of them hanging upon a neighbouring Elm.

WHAT is call'd the Grotto of *Pauſilypo* is a ſubterraneous Paſſage cut through a Hill of that Name between *Pozzuoli* and *Naples*. It is above half a Mile long[*], twenty Feet broad, and twice as high at each Entrance, but grows lower by Degrees, for the better Admiſſion of the Light. This Road was anciently very dark and duſty, which Inconveniences have been in ſome meaſure remedied by making Openings at the Top, and paving the Bottom of it; but ſtill it is a troubleſome and tedious Paſſage.

THE Grotto or Cave near the Lake *Averno*, wherein the famous *Cumæan* Sibyl is ſaid to have deliver'd her Oracles[†], is an amazing Work,

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Cloaths, and being weary and ſleepy had the good Fortune not to feel the Serpents about him till they had wrought his Cure.

[*] Biſhop *Burnet* ſays its Length is four hundred and forty Paces, for he walk'd it on foot to take its true Meaſure. He adds, that the Stone dug out there is good for Building; which makes it probable that this Cave was not originally cut for a Road, but was a Quarry of Stone.

[†] The *Sibyls*, among the Ancients, were Virgins ſuppoſed to be divinely inſpired, who in the Height of their Enthuſiaſm gave Oracles and foretold Things to come.

Work, being hewn out of a hard Rock. It is ſeven hundred Feet long, twenty broad, and about eighteen high; and at the End of this great Cave there is a narrow Paſſage, two hundred Feet in Length and ſeven in Height, which leads to a Kind of Apartment conſiſting of three little Rooms, where we perceive ſome Remains of Moſaic Work, and a Fountain of

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Authors are not agreed about the Number of Sibyls, ſome reckoning three, others four, and *Varro* ten; but the moſt celebrated were the *Delphic*, *Erythræan*, and *Cumæan*. The Sibylline Oracles were held in great Veneration, and the Books wherein they were written were kept by the *Romans* with infinite Care, nothing of Moment being undertaken without conſulting them. When theſe Propheteſſes receiv'd their pretended Inſpirations, their Looks grew wild, they were ſeized with violent Tremblings, and all the Symptoms of Madneſs and Diſtraction. Thus *Virgil* deſcribes the *Cumæan* Sibyl when receiving the divine *Afflatus*:

——Subito non vultus, non color unus,
Non comptæ manſere comæ; ſed pectus anhelum,
Et rabie fera corda tument, majorque videri,
Nec mortale ſonans, afflata eſt numine quando
Jam propiore Dei———— ÆNEID. VI.

Her Colour chang'd, her Face was not the ſame,
And hollow Groans from her deep Spirit came;
Her Hair ſtood up, convulſive Rage poſſeſs'd
Her trembling Limbs, and heav'd her lab'ring Breaſt:
Greater than human Kind ſhe ſeem'd to look,
And with an Accent more than mortal ſpoke;
Her ſtaring Eyes with ſparkling Fury roll,
When all the God comes ruſhing on her Soul.

DRYDEN.

clear Water, wherein the Sibyl is ſuppoſed to have bathed herſelf. From hence (it is ſaid) the Cave formerly ran quite to *Cumæ*, which is three long Miles; but the Paſſage is now choak'd by the falling in of the Rock in ſeveral Places.—The Marks of the Chiſſel appear in all Parts of this Grotto, which ſhew that it is not a Work of Nature, any more than that of *Pauſilypo*; and therefore, though we have deſcribed them here, both theſe Grotto's properly belong to the Antiquities of this Country.

IT would be endleſs to take notice of all the medicinal Springs in *Italy* and the neighbouring Iſlands, or even of thoſe which are to be found in the Kingdom of *Naples* alone. The Country abounds with hot Baths impregnated with Sulphur and other Minerals, which are frequented for many Diſtempers, eſpecially the Gout, Rheumatiſm, and Venereal Diſeaſes.—About a Mile from *Viterbo* there are ſeveral Springs on the Side of a Hill, which have a ſulphureous and brackiſh Taſte, and the Water is ſo hot as to harden Eggs, or even to ſcald the Hand, if not taken out preſently. They are ſurrounded with a low Wall, and ſend out four Streams or Rivulets into other Receptacles, where the Heat of the Water is much abated. Dr. *Breynius*, who ſaw them, wonder'd that they were ſo much neglected; though he would not adviſe the taking them internally, on account of the great Number of calcarious Particles they contain.

IN the Duchy of *Modena* there are ſeveral Springs or Wells, from the Surface of which is gather'd a ſubtle, inflammable, mineral Oil, of a fragrant bituminous Smell, and of different Colours. This is what we call *Petroleum*, Oil of Petre, or Rock-Oil, becauſe it frequently iſſues from the Clefts of Rocks, and the Springs on which it floats are generally found on craggy Mountains. Near a Place in this Duchy call'd *Frumetto* the Inhabitants dig Wells to come at theſe oily Springs, and find in thoſe at the Bottom of the Hill a large Quantity of red Oil, but thoſe near the Top yield a white Oil as clear as Water. There is another Rock near the *Apennines* in the ſame Country, from whence riſes a perpetual Spring of Water, on which this Oil ſwims, and in ſuch Quantities, that twice a Week they gather ſix Pounds at a time. The white tranſparent *Petroleum* is reckon'd the beſt, next to that the yellow, then the red, but the black is accounted the moſt impure of all.—This Oil is very warm and penetrating, and good in rheumatic and paralytic Diſorders.

THE little Lake near *Tivoli*, and the Rivulet call'd *Salforata* that iſſues from it, are remarkable for their offenſive ſulphureous Stench, which infects the Air to a conſiderable Diſtance. In the Lake are ſeveral floating Iſlands, fifteen or twenty Yards long, ſuppoſed to be form'd originally of ſulphureous Earth riſing from the Bottom; and the Banks ſeem to have encroach'd upon the Lake by an Incruſtation of the ſame Matter, which in Time may probably cover its whole Surface.

WE ſhall conclude this Article with a Curioſity in the Iſland of *Zant*, belonging to the *Venetians*, which is a Spring of freſh and clear Water, that throws up Pieces of real Pitch, ſome as big as one's Thumb, or even larger. Beſides this, when the Water has ſtood to be thoroughly ſettled, a Quantity of Pitch is found at the Bottom; and from this Spring it is ſaid the People procure annually about a hundred Barrels, with which they pitch their Ships and other Veſſels.

FOSSILS.

IN ſeveral Parts of *Italy*, and ſome of the neighbouring Iſlands, is found the *Lapis Aſbeſtos*, or *Amiantus**, by us call'd *Earth-Flax* and *Salamander's Wool*, which is a Sort of fiſſile Stone, or mineral Subſtance, of a whitiſh Colour and woolly Texture, conſiſting of ſmall Filaments, and endued with the wonderful Property of reſiſting Fire, and remaining unconſumed in the intenſeſt Heat. The Induſtry of Mankind has found out a Method of working this fibrous Mineral, and employing it in divers Manufactures, chiefly Cloth and Paper; though one would ſcarce imagine the Thing practicable without the Mixture of ſome other pliant Matter, as Wool, Hemp, or Flax, the Threads of the *Aſbeſtos* appearing too brittle for ſuch Uſes. The Cloth made of this incombuſtible Matter was in great Eſteem amongſt the Ancients, though better known and more common than in the preſent Times. *Pliny* ſays, he himſelf had ſeen Napkins of it, which being taken foul from the Table, and thrown into the Fire, were by that means cleanſed as if they had been waſh'd in Water: But the principal Uſe of it, according to the ſame Author, was to make Shrouds to wrap up the Corps of Kings, *&c.* that ſo their Aſhes might be preſerv'd diſtinct from thoſe of the Fuel, which compoſed the Funeral-Pile; and it is ſaid the *Tartars* ſtill make uſe of it in burning their Dead.—As to the Art of managing the *Aſbeſtos*, and of ſpinning and weaving it, *&c.* the Accounts we have are various. Signor *Caſtagnata*, Superintendant of ſome Mines in *Italy*, found in one of them a great Quantity of this lanuginous Mineral, and had the Skill of preparing it in ſuch a Manner as to reſemble a fine Lamb-Skin dreſſed white; and he could thicken or thin it to what Degree he pleaſed, ſo as to become either like a very white Skin, or a very white Paper; both which would reſiſt the moſt violent Fire, as he often experienced.—Signor *Ciampini* gives us the Method of ſpinning the *Aſbeſtos*, and making it into Cloth, which he thus effected. He firſt laid the Stone to ſoak for ſome time in warm Water, then open'd and divided it with his Hands, that the earthy Parts might fall out, which are whitiſh like Chalk, and ſerve to bind the fibrous Parts together. This Operation he repeated ſix or ſeven times with freſh Water, ſtill opening and ſqueezing the Mineral till all the heterogeneous Parts were waſh'd out, and then the Flax-like Parts were laid in a Sieve to dry. One Method of ſpinning the *Aſbeſtos* thus cleanſed is to card it gently, and then lay it between the Cards ſo that ſome of it may hang out of the Sides. Having faſten'd the Cards on a Table or Bench, take a ſmall Reel made with a little Hook at the End, and a Part by which it may be eaſily turn'd round. This Reel is to be wound over with white Thread, and a ſmall Veſſel muſt be in Readineſs, with which the Fore-Finger and Thumb are conſtantly to be kept moiſt, both to preſerve the Skin and to render the Filaments of the Stone more ſoft and pliant; and ſo by twiſting about the Thread upon the Reel with the *Aſbeſtos* hanging out of the Cards, ſome of the latter will be work'd up with it, and this Thread may, with Care, be woven into a coarſe Sort of Cloth, which being put into the Fire, the Thread and Oil will be conſumed, and the incombuſtible Cloth remain. But this Method being very tedious, inſtead of the Thread it is better to put ſome Flax on a Diſtaff, and by taking three or four Filaments of the Stone and mixing them with the Flax, they may be eaſily twiſted together, and the Thread thus made will be more ſtrong and durable; ſo that Carding is unneceſſary, and rather breaks the Filaments than does any Service.—In waſhing the Stone, the ſame Gentleman obſerves, there will remain ſeveral ſhort Pieces at the Bottom of the Water, of which Paper may be made after the common Method. He adds, that the beſt Way to preſerve the Cloth or any thing made of this Mineral, which by reaſon of its Dryneſs is very apt to break and waſte, is to keep it well oil'd; and when the Cloth is put in the Fire, the Oil burns off, and the Cloth comes out white and purified*.

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* This Stone is not peculiar to *Italy*, or the *Mediterranean* Iſlands, but is found in *India*, *Tartary*, *Siberia*, *Egypt*, and *Greece*; likewiſe in *France*, the *Netherlands*, the Iſle of *Angleſey* in *Wales*, in *Scotland*, and many other Parts of the World.—Mr. *Lloyd* (*Phil. Tranſ.* N°. 166) had ſome Paper made of that found in the Iſle of *Angleſey*, which proved coarſe and apt to tear; but being the firſt Attempt, there was great Reaſon to think it might be much improved: And Yarn was made of that which Mr *Wilſon* diſcover'd in *Scotland*.

UNDER this Article we ſhall place the *Pumice-Stone*,

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* It is a common Opinion that the *Aſbeſtos* loſes nothing of its Weight in the Fire; and this ſeems to be confirm'd by what S. *Ciampini* tells us, that he kept it for three Weeks in a Glaſs-houſe Fire, and found it unalter'd. But in two Trials before the *Royal Society*, a Piece of Cloth made of this Stone, a Foot long and half a Foot broad, loſt each time above a Dram of its Weight. It is remarkable, that when taken out red-hot, it did not burn a Piece of white Paper on which it was laid.

Stone, which is frequent in *Italy* and *Sicily*, being thrown up by the Eruptions of *Veſuvius* and *Ætna*. Naturaliſts indeed are not well agreed about the Nature and Origin of Pumice, ſome taking it to be Pieces of Rock half-burnt and calcined, and caſt into the Sea by Volcanoes, where being waſh'd by the Salt-Water it acquires a whitiſh or greyiſh Colour. Others will have it to riſe from the Bottom of the Sea, whence they ſuppoſe it detached by ſubterranean Fires; and hence they account for its ſaline Taſte, its Lightneſs, and Poroſity. In Confirmation hereof they alſo alledge, that theſe Stones are frequently found in Parts of the Sea far remote from all Volcano's; and add, that ſeveral Parts of the *Archipelago* are ſometimes cover'd with them all on a ſudden, after a few inward Shakes and Heavings of the Bottom *. —The Pumice is of ſome Uſe in Medicine, but much more in the Arts and Manufactures.

IN ſeveral of the *Alps* of *Savoy*, near the *Glacieres*, they dig from amongſt the Rocks a Species of Cryſtal, which they diſcover by ſome Veins that appear on the Surface, and are commonly of a whitiſh and blueiſh Colour. They break the Rock, and find the Cryſtal in Cavities, perhaps ſeveral Feet deep, which they call Ovens. It is tranſparent, reſembling a Diamond, but much inferior to it in Hardneſs and Luſtre. The Shoots of it are of different Lengths and Bigneſs, but all of them hexagonal, and terminating in a Point, the other End adhering to a Sort of irregular Stone, which is ſtiled the *Matrix* of the Cryſtal. The Rocks ſometimes fall into the frozen Vallies, where People find the Cryſtal on the Surface of the Ice.

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* Mr. *Dove* gives us an Account in the *Philoſophical Tranſactions* of a ſurprizing Shoal of Pumice-Stones which he ſaw floating in the *Ethiopic* Ocean, from the 22d to the 26th of *March*, during which Time his Ship ſail'd above three hundred Miles; and when he firſt diſcover'd theſe Stones, whereof ſome were as big as a Man's Head, he reckons they were 186 Leagues from the neareſt Land.

IN the *Alps* and *Apennines* they likewiſe dig up Talc, a Sort of ſhining Stone, eaſily diviſible into thin tranſparent Scales or Leaves, a little flexible. Some Talc is of a Silver-Colour, and ſome yellow; but that we have from *Venice* is reckon'd the beſt, which is brought to us in large greeniſh Stones, but when wrought becomes white and exceedingly pellucid *.

THERE is found in the Neighbourhood of *Bologna* a grey, gloſſy, ponderous Stone, about the Size of a large Walnut, which being properly prepared and calcined makes a Species of Phoſphorus. This was accidentally diſcover'd by one *Caſciarlo*, a Chymiſt, who having gather'd ſome of theſe Stones and carried them home, in hopes of extracting Silver out of them by Fire, found that after a certain Proceſs, being expoſed to the Light, they retain'd it in ſuch a Manner, as to ſhine in the dark for a conſiderable Time. Some affirm, that the true Art of preparing and calcining this Stone is loſt; and we are told of a Perſon who had a Method of making Statues and Pictures of it, that would appear luminous in the dark, but that he died without diſcovering his Secret*.

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* The Talc brought from *Muſcovy* is reddiſh when in the Stone, but it ſeldom comes to us otherwiſe than in Leaves, which are hard, ſmooth, gloſſy, and very tranſparent, whence it is call'd *Muſcovy Glaſs*, and is uſed for Lanterns, to cover Paintings, *&c.* The *Lapis ſpecularis* of *Pliny* is a Species of Talc, which he obſerves the *Romans* uſed for Window-Lights, as they do now in ſome Countries where it is found.

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* It is to be obſerved, that the *Bononian* Stone, though it reſembles a burning Coal, never emits any Heat; but the Effects of the burning Phoſphorus, which is a chymical Preparation made of Sand and Urine, are very ſurpriſing. With a Piece of *ſolid* Phoſphorus one may write on Paper, Plaiſter, &c. and the Letters in the dark will appear like Flame, but when a Candle is brought in, the Shining diſappears. A Bit of it rubb'd between two Papers takes Fire inſtantaneouſly, but if a Perſon is not careful in the Management of it, he is in Danger of burning his Fingers; and it penetrates deeper into the Fleſh than common Fire. M. *Caſſini* happening to preſs a Piece in a Cloth between his Fingers, the Cloth took Fire; he endeavour'd to extinguiſh it with his Foot, but his Shoe caught the Flame, and he was forced to put it out with a Braſs-Ruler, which ſhot forth Rays in the Dark for two Months after. This Sort of Phoſphorus muſt be kept in a Vial full of Water. It diſſolves in all Sorts of diſtill'd Oils, and in that State is call'd *liquid* Phoſphorus; or

VEGETABLES.

OF the vegetable Productions of *Italy* we know of none more remarkable than a Kind of Aſh-Tree, growing chiefly in *Calabria*, from which, in the Heat of Summer, flows a white ſweetiſh Juice or Gum, call'd *Manna*, which is of great Uſe in Medicine, being one of the mildeſt and ſafeſt Purgatives in Nature. There are three Kinds of this *Calabrian* Manna, one call'd *Manna di Corpo*, which is the fineſt of all, and is ſpontaneouſly diſcharged from the Trunk and large Branches of the Tree, in form of a cryſtalline Liquor, which is harden'd into Grains of different Sizes, and carefully gather'd the ſucceeding Day. The ſecond *Species*, which the *Italians* call *Manna forzata* or *forzatella*, is obtained by making Inciſions in the Bark of the Tree in *Auguſt*, after the natural Diſcharge ceaſes. From theſe Inciſions the Manna flows copiouſly from Noon till towards Midnight, and is next Day expoſed to the Sun in order to be dried; but this Sort is leſs eſteem'd, on account of its Impurity and yellow Colour. The third Species, call'd *Manna di Frondi*, iſſues ſpontaneouſly, like a Kind of Sweat, from the nervous Parts of the Leaves,

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it may be ground with Pomatums into a luminous Unguent. — See Mr. *Boyle*'s Treatiſe on this Subject, entitled *Noctiluca*.

on which the Drops are indurated by the Sun into Grains about the Bigneſs of Wheat; but this laſt Sort is not conſtantly gather'd, becauſe it cannot be ſeparated from the Leaves without the greateſt Difficulty.—This excellent Drug is perhaps the moſt extenſively uſeful Cathartic in the Shops, being in its Nature accommodated to Perſons of all Ages, Sexes, Conſtitutions, and Countries. That is reckon'd beſt which is white and recent, the dark-colour'd and brown being old and decay'd.

THE *Cork-Tree*, which grows plentifully in *Italy*, as well as in *Spain* and other warm Countries, is a Sort of ever-green Oak, whoſe Leaves are green above and white underneath, and its Fruit is a real Acorn, more nouriſhing to Swine than that of the common Oak. Its Bark, which is the Cork, would ſplit and peel off of itſelf, being puſh'd up by another Bark form'd underneath; but to prevent this Effort of Nature, and to acquire large and even Pieces of Cork, it is cuſtomary to make perpendicular Inciſions the whole Length of the Tree, and circular ones towards the Top and Bottom of the Trunk; and the Bark being thus ſtripp'd off is laid in Water to render it pliable, and flatted by loading it with heavy Weights; after which it is dried, and put up in Bales for Carriage.

THERE is a Kind of ſubterraneous vegetable Production call'd *Truffles*, which are very common in *Italy*, and larger than in other Parts of *Europe*. Mr. *Bradley* calls them *under-ground edible Muſhrooms*, and Botaniſts in general now agree to rank them among the Number of Plants, though they ſeem to want moſt of the uſual Parts thereof. All we know of their Growth is, that they are at firſt no bigger than a Pea, reddiſh without, and whitiſh within; and that, as they ripen, the white Parts grow more duſky and black; but there ſtill remains a Number of white Streaks which all terminate at the Places where the outer Coat is crack'd or open, and which are probably the Veſſels whereby the Truffles receive their Nouriſhment. In theſe Veſſels is found a whitiſh Matter, and in the Middle of it, when view'd with a Microſcope, are perceived little round black Grains, ſuppoſed to be the Seed of the Truffles*; for the curious Obſervations of modern Naturaliſts ſeem to have put it beyond Diſpute, that all Plants, even Muſhrooms, Moſſes, *&c.* have their ſeveral Seeds†, though ſome are ſo ſmall as to be abſolutely inviſible, at leaſt without the Help of Glaſſes.—Truffles lye commonly about half a Foot below the Surface of the Ground, and ſometimes deeper. They are tendereſt and beſt in the Spring, but are moſt eaſily found in Autumn, when the Wet ſwells them, and the Thunder and Lightning diſpoſes

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* What confirms the Opinion of Truffles coming from Seed is, that they have been lately found in *England*, in a particular Part of *Northamptonſhire* near *Ruſhton*, a Place ſtock'd with Plants formerly brought from *Languedoc*; and it is only ſince that Time that any Truffles have been there obſerved, whence it is concluded, that the Seed of them was brought from *France* among the Roots of the other Plants. Dr. *Hatton*, who firſt diſcover'd theſe *Engliſh* Truffles, obſerved ſeveral little Fibres iſſuing out of them, which in all Probability do the Office of Roots.

† Botaniſts have been extremely puzzled about the Origin and Production of Muſhrooms, not having yet

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been able to diſcover their Seed by the beſt Microſcopes; and how a Plant ſhould be produced without a Seed is a Myſtery. M. *Tournefort*, in the *Memoirs of the Royal Academy*, has given a curious Account of the Culture of Muſhrooms, which may be raiſed in abundance by ranging Balls of Horſe-dung as big as one's Fiſt in Lines about three Feet from each other, and at the Depth of one Foot under-ground, and covering theſe over with Mould, and that again with Horſe-dung. After it has laid a proper Time, the Dung will begin to whiten and grow mouldy, being cover'd all over with fine white Hairs or Threads, branch'd and woven about the Straws whereof the Dung is compoſed, which now loſes its former Smell, and ſends forth an admirable Odour of Muſhrooms. Theſe Hairs are probably no other than the open'd Seeds or Buds of Muſhrooms, which Seeds were before incloſed in the Dung, but ſo ſmall as not to be perceiv'd. By degrees the Extremity of theſe Hairs grows round into a Kind of Button, which at length opens itſelf into a Muſhroom, whereof the lower Part is a Kind of Pedicle or Stalk, bearded where it enters the Ground, and at the other End loaden with a roundiſh Head, which expands itſelf without producing either Seeds or Flowers that are diſcernible. The Bottom is ſpread with *Laminæ*, proceeding from the Center to the Circumference, which may be call'd the Leaves of the Muſhroom.—Now as it is not to be conceived how ſo artful and delicate a Structure as that of a Plant ſhould reſult from the fortuitous Concourſe of a them to ſend forth their Scent, by which the Swine frequently diſcover them and grub them up, from whence they are call'd *Swine bread* by the common People. In *Italy* they are reckon'd a great Dainty, either fried in Slices with Oil, Salt, and Pepper, or boil'd in Soup, or pickled. Some roaſt them in Aſhes like

ſew Juices differently agitated, there is no Room to doubt that Muſhrooms, like all other Plants, have their Origin in Seeds; eſpecially as we know that the Seeds of Plants cannot vegetate every where, but only where they find certain Juices fit to penetrate their Coats, to excite a Fermentation, and to afford them Nouriſhment. Accordingly we may obſerve in what Diverſity of Places the different Species of Muſhrooms are produced, ſome of them growing only on other particular Plants, whoſe Trunk, Bark, or Roots alone have Juices proper to promote their Vegetation. Hence it ſeems to follow, that the Seeds of Muſhrooms are ſcatter'd in numberleſs Places where they do not vegetate, in a word, over all the Earth; and the ſame may be ſaid of many other Plants. The Imagination indeed is ſhock'd at ſuch a prodigious Diſperſion of different Seeds thrown every where at random, and in many Places to no Purpoſe; but the Plants growing on the Trunks of Trees, on Walls, in the Clefts of Rocks, *&c.* are inconteſtable Proofs both of the vaſt Multitude of Seeds ſo diſperſed, and the Neceſſity of certain Circumſtances to make them vegetate.—If to the inviſible Seeds of Plants we join the inviſible Eggs of Inſects, we ſhall find the Earth fill'd with an inconceivable Infinity of Vegetables and Animals, perfectly form'd, and waiting only for certain favourable Circumſtances to enable them to make their Appearance. How rich then muſt the Hand be that has ſown with ſo much Profuſion!

Potatoes, others pulverize and mix them in Sauces.

THOUGH ſome of the *Alps* and *Apennines* are very barren and rocky, yet many of them are cover'd with Oaks, Pines, Cheſnut-Trees, Walnut-Trees, *&c.* and others abound with Variety of Ever-greens and pleaſant Shrubs, together with wild Thyme, Marjoram, and ſuch-like aromatic Herbs and medicinal Simples; but as a particular Deſcription of theſe would be endleſs, as well as unneceſſary, we ſhall proceed to conſider ſome of the moſt remarkable Animals of this Country.

ANIMALS.

THE *Alps* and other Mountains of *Italy* are ſtock'd with various Kinds of four-footed Creatures, ſuch as Wild Boars, Wolves, Deer, Hares, Rabbets, *&c.* which are too well known to require a Deſcription: But there are ſome with which we are leſs acquainted, and therefore deſerve our Notice. The *Marmote*, or *Marmotto*, is a Kind of Rat inhabiting the higheſt and rocky Parts of thoſe Mountains, and feeding on the little Graſs and wild Herbs they afford. They are larger than the common Rats, very fat, and ſleep all the Winter*.

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* Mr. *Martel*, when he viſited the *Glacieres* of *Savoy*, was told by the Country-People that the Marmotes provide themſelves a warm Bed againſt their Time of

Their Fat ſerves the People to burn in their Lamps, and is of ſome Uſe in Medicine, being recommended in nervous Affections, and for Stiffneſs and Contractions of the Joints.

THE *Chamois* is a Sort of wild Goat, of which great Numbers are found among the *Alps*, in Shape and Size reſembling the tame one, with ſhort ſmooth Horns, hook'd at the Extremities. They leap from one Rock to another with ſurprizing Agility, and are the more difficult to be caught, as ſome of the Herd are always on the Hills about them, which by a certain Noiſe give an Alarm to the reſt upon any Appearance of Danger. The Fleſh of theſe Animals is very good, and of their Skins is made the true *Chamoy* or *Shammy* Leather, ſo much eſteemed for its Softneſs and Pliancy, and its bearing Soap without Damage.

THE *Bouquetins* are another Kind of wild Goat, not ſo ſhaggy as the former, but much larger, having long Horns, with which they make a ſtout and deſperate Defence when they are attack'd. They live on the higheſt Mountains, ſeldom coming down into the Valleys, which makes the hunting of them very troubleſome

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ſleeping; for which Purpoſe one of them lies upon its Back, whilſt another loads it with Graſs or other Herbs, and then drags it by the Ears to their Hole. They alſo inform'd him, that theſe Animals provide againſt being ſurprized, by placing Centinels, who give them the Alarm by a whiſtling Noiſe. He ſays the Inhabitants eat the Marmotes, and find them very good Meat.

and dangerous; and when they are cloſely purſued, they will throw themſelves down the Precipices, having the Art of breaking their Fall by the Help of their Horns, ſo as not to receive any Hurt. The Edges of their Hoofs are ſo ſharp and hard, that they make an Impreſſion upon the Rocks; and it is ſaid they can ſmell a Hunter at a great Diſtance. The *Savoyards* dry their Blood and preſerve it, eſteeming it an excellent Remedy for pleuritic Diſorders.

AMONGST the Birds that frequent the *Alps* and other craggy Mountains, the *Eagle* is the nobleſt and moſt worthy Obſervation. It is the largeſt, ſtrongeſt, and ſwifteſt of all the Birds that live by Prey, and its Sight is quick and piercing, even to a Proverb *. It has a long hooked Beak, yellow ſcaly Legs, thick crooked Talons, and a ſhort Tail; and its Plumage is cheſnut-colour'd, brown, ruddy, and white. The is Eagle diſtinguiſh'd from the Hawk by his Bigneſs, and from the Vultur by the Crookedneſs of his Beak, which is black at the Tip, and blue in the Middle, though in ſome yellow.—Theſe Birds uſually make their Airy or Neſt on the higheſt Rocks, conveying thither to feed their Young not only Partridges, Pheaſants, Woodcocks, *&c.* but even Hares, Lambs, Kids, Fawns, or whatever Prey the neighbouring Country affords *. If the Rock where the Neſt is built be not quite inacceſſible, it is uſual for the Shepherds to climb up to it, and take away the Proviſions from the young Eagle while the old ones are abſent, leaving the Entrails of Animals, or ſome ſuch Food, in the Room of what they take: And thus the Tables of ſome Gentlemen are furniſh'd with the beſt of Game, though perhaps deprived of a Leg or a Wing by the

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* By this means the Eagle, and ſuch-like Birds, can diſcover their Prey at a great Diſtance. *She dwelleth and abideth on the Rock, on the Crag of the Rock, and the ſtrong Place: From thence ſhe ſeeketh her Prey, and her Eyes behold afar off.* Job xxxix. 28, 29.—The Reaſon why the Eagle is able to face the Sun, and endure its brighteſt Rays, is becauſe it has two Sets of Eye-lids, the one thick and cloſe, the other thinner and finer, which laſt it draws over the Eye when it views that luminous Body. This thin Covering of the Eye, which is not peculiar to the Eagle, but found in ſome other Birds, Fiſhes, &c. is what Anatomiſts call the *Nictitating Membrane*.

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* Mr. *Ray* mentions an Eagle's Neſt, found near the River *Derwent* in 1668, conſiſting of large Sticks, one End whereof was laid on a Rock, and the other on two Birch-Trees. It was two Yards ſquare, and had a young Eagle in it, with the Carcaſſes of one Lamb, one Hare, and three *Grygalli.*—Nor will Eagles only ſeize upon Lambs, Kids, *&c.* but even Children too, if they have an Opportunity, as appears from an Inſtance given us by Sir *Robert Sibbald*, of an Eagle that took up a young Child at a Place call'd *Houghton-Head*, and carried it to its Neſt in *Hoy*, one of the *Orkney* Iſlands, four Miles diſtant; but being immediately follow'd by four Men in a Boat, who knew where the Neſt was, they brought back the Child unhurt. *Prodig. Nat. Hiſt. Scot.* L. III.

Voraciouſneſs of the Parent-Eagle or its Offſpring*.

IF we deſcend to conſider the minuter Part of the Animal Creation, perhaps we ſhall find nothing of that Kind in *Italy* more ſurprizing than the *Tarantula*, a venomous Kind of Spider, chiefly found in *Apulia* near the City of *Tarento*, from whence its Name. This Inſect is about the Size of an Acorn, has eight Legs and as many Eyes, is hairy, and of various Colours. From its Mouth proceed two Horns or Trunks made a little crooked, with the Points exceeding ſharp, through which its Poiſon is emitted; and theſe Horns are in continual Motion, eſpecially when the Animal is ſeeking for Food, as if they did the Office of Noſtrils. Some are of Opinion, that the Bite or Sting of the *Tarantula* is only venomous in the Heat of Summer; however, it is particularly dangerous at that Seaſon, producing very fatal and aſtoniſhing Effects. The Bite at firſt occaſions a Pain like that of the Stinging of a Bee, and in a few Hours the Patient feels a Numbneſs, and a livid Circle appears about the Part affected, which ſoon riſes into a painful Tumor. In a little Time he falls into a profound Sadneſs, breathes with Difficulty, his Pulſe grows feeble, and at length he loſes all Senſe and Motion. Some People wounded by this Inſect ſhew a ſtrange Averſion to this or that particular Colour, and expreſs great Pleaſure at the Sight of others. Tremblings, Anger, Fear, Laughter, obſcene Talk and Actions, are likewiſe ſome of the ſtrange Symptoms attending Perſons bit by the *Tarantula*; and the Wound proves mortal in a few Days, unleſs proper Means are uſed to expel the Poiſon. All the Aſſiſtance of Medicine in this Caſe is found to be of little Efficacy, Muſick being the only certain Remedy yet diſcover'd. Accordingly, when the Patient has loſt his Senſe and Motion, a Muſician tries ſeveral briſk Tunes, till he hits upon one that is agreeable to the diſorder'd Perſon; which is known by his firſt moving his Fingers, then his Arms, then his Legs, and by degrees his whole Body, till at length he riſes and begins to dance, which he continues for ſeveral Hours without Intermiſſion. He is then put to Bed, and when he is thought to have ſufficiently recover'd his Strength, the Muſician plays up the ſame Tune, upon which he riſes and renews his dancing. This Exerciſe is continued for five or ſix Days together, till the Patient finds himſelf exceedingly fatigued, and unable to dance any longer, which is a Sign of his being cured; for as long as the Poiſon operates he ſhews no Wearineſs. When he comes to himſelf, he is like one awak'd out of a ſound Sleep, having no Remembrance of his dancing, or any thing that paſs'd during his Diſorder. If the Cure be not thoroughly effected, a melancholy Gloom continues to hang about him, he avoids Company, and perhaps takes an Opportunity of drowning himſelf. Some People have annual Returns of their Fits for many Years together, at which Times Recourſe is had, as before, to Muſick and Dancing, nothing elſe affording any Relief*.

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* M. *de Thou*, in the *Memoirs of his Life*, tells us, that he himſelf once dined with a certain great Man, and obſerv'd with ſome Surprize that all the Wild-Fowl brought to Table wanted a Leg, Wing, or other Part, till he was inform'd they were taken as above-mention'd from an Eagle's Airy in the Neighbourhood.

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* M. *Geoffroy* accounts for the Effects of the *Tarantula*'s Bite by ſuppoſing the Poiſon to give the Nerves a Degree of Tenſion beyond what is natural or proportionate to their Functions, whence ariſes a Privation of Knowledge and Motion. But at the ſame time this Tenſion, equal to that of ſome Strings of an Inſtrument, puts the Nerves in Uniſon to certain Tones, and obliges them to ſhake, when agitated by the Undulations and Vibrations of the Air proper to thoſe Tones. And hence this wonderful Cure by Muſick, which having reſtored the Nerves to their Motion, they call back the Spirits that had abandon'd them.—Dr. *Mead* imagines the Malignity of the *Tarantula*'s Poiſon to conſiſt in its great Force and Energy, whereby it immediately raiſes an extraordinary Fermentation in the whole arterial Fluid. And as to Perſons bit by this Inſect, the Benefit they receive from Muſick ariſes not only from their dancing to it, and ſo evacuating by Sweat a great Part of the Poiſon; but the repeated Percuſſions and Vibrations of the Air ſhake the contractile Fibres of the Membranes of the Body, eſpecially thoſe of the Ear, which being contiguous to the Brain communicate their Tremblings to its Membranes and Veſſels; and thus the Cohesion of the Parts of the Blood is broken, and the Coagulation prevented.—No

ANTIQUITIES.

ITALY abounds with ſo many noble Monuments of Antiquity, that it is impoſſible we ſhould give an Account of them all, without far exceeding the Limits and Deſign of our Undertaking. We cannot forbear, however, being a little particular in deſcribing thoſe of

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body will doubt the Truth of this, who conſiders the wonderful Effects of Muſick in Variety of other Inſtances both ancient and modern. *Timotheus* could excite *Alexander*'s Fury by the *Phrygian* Mode, and ſooth him into Indolence by the *Lydian*; and a certain Muſician is ſaid to have put *Eric* King of *Denmark* into ſuch a Rage as to kill ſome of his beſt Servants. So likewiſe an *Italian*, mention'd by Dr. *Niewentiit*, by varying his Muſick from briſk to ſolemn, and *vice verſâ*, could work up the Hearer to Madneſs and Diſtraction.—But Muſick not only exerts its Influence on our Affections, but on the Parts of our Bodies alſo; as appears from the *Gaſcon* Knight, mention'd by Mr. *Boyle*, who could not contain his Water at the playing of a Bagpipe; ſo that a Perſon, whom he had diſobliged, cauſed him by that means to bepiſs himſelf at a Feaſt, when he was hemm'd in with Company. The ſame Author tells us of a Woman that would burſt into Tears on hearing a certain Tune, with which other People were little affected. And we have an Inſtance in the *Hiſtory of the Academy of Sciences* of a Muſician who was cured of a violent Fever by a Concert play'd in his Chamber. — Nor are our Minds and Bodies alone affected by Sounds, but alſo Things inanimate. *Kircher*, amongſt many Stories of the like Nature, tells us of a large Stone that would tremble at the Sound of one particular Organ-Pipe; and *Morhoff*

Rome, that celebrated Metropolis and once Miſtreſs of the World, every Part of which is fill'd with Evidences of its ancient Grandeur.

OF the Pagan Temples remaining in that City, the *Pantheon*, uſually call'd the *Rotonda* from its circular Form, is one of the moſt entire and beautiful. It is now dedicated to the Bleſſed Virgin and all Saints, as it was anciently to all the Heathen Deities. This Temple is a hundred and forty Feet high, and about as many in Diameter; its Roof is vaulted in form of a Dome or Cupola, but open at top, from whence the Structure receives all its Light. The Walls are lined with Marble, and the Roof was formerly cover'd with Braſs, which was removed by one of the Popes, and converted into four wreath'd Pillars that ſupport the Canopy of the High Altar of St. *Peter*'s Church. The Portico is exceedingly majeſtic, being ſupported by ſixteen tall Columns of *Egyptian* Granite, each conſiſting of one Stone, of the *Co-*

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mentions a *Dutchman* who could break Rummer-Glaſſes with the Tone of his Voice. *Merſenne* takes notice of a Pavement that would ſhake, as if the Earth would open, when the Organs play'd: And Mr. *Boyle* ſays that Seats will tremble at the Sound of Organs, and that he has felt his Hat do ſo under his Hand at certain Notes both of Organs and Diſcourſe.—Theſe, and many other well-atteſted Inſtances of the ſtrange Effects of Sounds that might be mention'd, may help us in ſome meaſure to account for, at leaſt induce us to believe, the Power of Muſick over Perſons diſorder'd by the Bite of the *Tarantula*.

rinthian Order; and the Gate is forty Feet high, and twenty wide. The *Pantheon* was built by *Agrippa*, Son-in-Law of *Auguſtus*, as appears by an Inſcription ſtill remaining over the Portico.

THE Temple of *Fortune* has withſtood the Injuries of Time, and is now a Chriſtian Church; as is alſo the Temple of the *Sun*, or of *Veſta*, which is a ſmall round Structure, receiving its Light from a Hole in the Top, after the Manner of the *Pantheon.*—The Church of St. *Stephen* on Mount *Celio* was formerly the Temple of *Faunus*. It is a large round Edifice, ſupported by two Circles of Pillars, one within the other, the Pillars of the outermoſt Circle being leſs than thoſe of the innermoſt, and juſt twice the Number.

WITHOUT the Walls is the Church of St. *Conſtantia*, originally a Temple of *Bacchus*, which remains almoſt entire, and has ſuffer'd little Alteration. It is likewiſe of a circular Form, ſuſtained by twelve large Pillars without, and twelve leſſer ones within. The Tomb of *Bacchus* is of Porphyry, adorn'd with Vine-Branches, Boys treading Grapes, Birds, and other Animals, in *Baſſo-Relievo*. The Roof is alſo beautified with Moſaic Work, repreſenting Bunches of Grapes, and ſeveral Things relating to the Vintage: But ſome ſuſpect theſe Ornaments are not ſo ancient as the Temple itſelf.

THERE is ſcarce any thing ſtanding of the Temple of *Peace*, except three Arches, but by tracing the Foundation it appears to have exceeded all the other Temples of *Rome* in its Dimenſions. The largeſt Marble Pillar in *Rome*, of one entire Stone, which now ſtands before the Church of St. *Mary Maggiore*, was taken out of the Ruins of this Temple.—The Remains of ſeveral other Structures of this Kind might be mention'd, but theſe are ſufficient.

OF the *Triumphal Arches* remaining in *Rome*, there is one very entire, which was erected to *Septimius Severus* in Memory of his *Parthian* Conqueſts. It is of Marble, and adorn'd on each Side with Baſs-Reliefs repreſenting the Victories of that Emperor, and the under Part of it is finely wrought with a vaſt Variety of Flowers.—But the Arch of *Conſtantine* the Great though ſomewhat broken and defaced, is the nobleſt Structure of this Kind in *Rome*, and perhaps in the whole World. It was erected to him by the Senate, on account of his Victory gain'd over the Tyrant *Maxentius*, and was beautified with excellent Statues and Baſs-Reliefs repreſenting his moſt memorable Actions. Several of theſe Statues have now loſt their Heads, which it is ſaid were removed to *Florence* by one of the Dukes of *Tuſcany*.—The Arch of *Titus*, erected to him in Memory of his taking and deſtroying the City of *Jeruſalem*, is more defaced than either of the former; but one may ſtill diſcern upon it a Repreſentation of the River *Jordan*, and many of the Spoils of *Solomon*'s Temple.

THERE are four *Columns* in *Rome* that are remarkable for their Antiquity and excellent Workmanſhip, particularly that erected in honour of the Emperor *Trajan*, which is about a hundred and thirty Feet high, excluſive of the Pedeſtal. It conſiſts of large Pieces of white Marble, hollow within, and ſo curiouſly cemented as to ſeem but one entire Stone. Within it there is a ſpiral Stair-Caſe up to the Top, to which the Light is admitted by many little Windows; and the Outſide is adorn'd with fine Baſs-Reliefs repreſenting the great Actions of that Emperor. Inſtead of a golden Urn at the Top of it, in which his Aſhes were depoſited, there is now a Statue of St. *Peter*.

THE Column of *Antoninus Pius* is taller than that of *Trajan*, but inferior to it in the Beauty of the Workmanſhip. In the Room of the Emperor's Statue, which was formerly on the Top of it, there is one of St. *Paul*. The Ornaments on the Outſide are of the ſame Nature as thoſe on the *Trajan* Column, and amongſt other hiſtorical Pieces there is a Figure of *Jupiter Pluvius* ſending down Rain on *Antoninus*'s fainting Army, and Thunderbolts on his Enemies; which ſeems to be a great Confirmation of the Story of the *Chriſtian Legion* *.

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* Eccleſiaſtical Hiſtorians relate, that in one of *Antoninus*'s Expeditions, when his Army was ſurrounded by the Enemy, and ready to periſh for want of Water, a Legion conſiſting of Chriſtian Soldiers obtain'd by their Pray-

THE *Columna Roſtrata* is a curious Piece of Antiquity, having been erected to the Honour of *Caius Duilius* for a ſignal Victory gain'd over the *Carthaginian* and *Sicilian* Fleets, above 250 Years before the Birth of our Saviour. It was adorn'd with the Beaks of the Veſſels taken in the Engagement, and has an Inſcription on its Baſe, but great Part of it is not legible.—The *Milliary Column*, from whence the *Romans* reckon'd their Miles to all Parts of *Italy*, is ſtill to be ſeen at *Rome*. It is of white Marble, about eight Feet high, and formerly ſtood in the *Forum Romanum*, but is now removed to the *Capitol*.

OF the great Number of *Obeliſks* that were in ancient *Rome*, the moſt beautiful now remaining ſtands in the Piazza before St. *Peter's*

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ers a plentiful Shower of Rain, and at the ſame time a terrible Storm of Thunder and Lightning, which deſtroy'd great Numbers of the Enemy's Army, and made way for a compleat Victory. Mr. *Addiſon* has given us a Tranſlation of a beautiful Paſſage in *Claudian*, deſcribing the Effects of this Tempeſt,

When, with deſcending Show'rs of Brimſtone fir'd,
The wild Barbarian in the Storm expir'd.
Wrapt in devouring Flames the Horſeman rag'd,
And ſpurr'd the Steed in equal Flames engag'd.
Another pent in his ſcorch'd Armour glow'd,
While from his Head the melting Helmet flow'd:
Swords by the Lightning's ſubtil Force diſtill'd,
And the cold Sheath with running Metal fill'd.
No human Arm its weak Aſſiſtance brought,
But Heav'n, offended Heav'n, the Battle fought.

Church, whither it was brought from the *Circus* of *Nero*, in the Ruins whereof it had lain buried for many Ages. It is one entire Piece of *Egyptian* Marble, ſeventy-two Feet high, twelve Feet ſquare at the Baſe and eight at the Top, and is computed to weigh above 478 Tons, and ſuppoſed to be at leaſt three thouſand Years old. Notwithſtanding its immenſe Weight, it was erected on a Pedeſtal thirty Feet high, (whereon it now ſtands) by that celebrated Architect *Dominico Fontana*, in the Pontificate of *Sixtus* V, with vaſt Expence and Labour, and to the Aſtoniſhment of all the Spectators.

THE Obeliſk which ſtands before the Church of St. *John de Lateran* is the talleſt in *Rome*, being a hundred and eight Feet high without the Pedeſtal, nine Feet and a half at the Baſe one way, and eight the other. On each Face of it are ſeveral Rows of Hieroglyphicks, a Sort of myſtic Figures or Characters uſed by the ancient *Egyptians* to conceal the Secrets of their Theology. It is thought to have been conſecrated to the Sun in the City of *Thebes*, about twelve hundred Years before the Coming of *Chriſt*; and having been ſent to *Rome* by the Son of the Emperor *Conſtantine* was ſet up in the *Circus Maximus*, where it was found buried in the Ruins, and broken into three Pieces. The Parts were cemented by the ingenious Architect juſt mention'd, and placed in their preſent Situation.

THERE is another fine Obeliſk, which was brought from *Heliopolis* in *Egypt*, and likewiſe lay a long time broken to pieces among the Ruins of the ſame *Circus*, till it was join'd together and erected in the Piazza *del Popoli* by the Direction of the aforeſaid *Fontana*.—As to the other Obeliſks in *Rome*, they are of a ſmaller Size, and ſome of them ſeem to be the Tops of Obeliſks broken off; but the Hieroglyphicks upon them are ſufficient Proofs of their Antiquity.

OF the ancient *Theatres* and *Amphitheatres* in this City we find only the Ruins of four remaining, *viz.* ſome ſmall Footſteps of the Theatre of *Pompey*, Part of the Theatre of *Marcellus*, of the Amphitheatre of *Statilius Taurus*, and of that of *Titus*, now call'd the *Coliſeo*, of which there are large Remains. This noble Structure was not only remarkable for the Beauty of its Architecture, but for its Dimenſions and admirable Contrivance, having Seats capable of containing eighty-five thouſand Spectators. It was of an oval Figure within, and adorn'd with Statues repreſenting the ſeveral Provinces of the *Roman* Empire, in the Middle whereof ſtood that of *Rome*, holding a golden Apple in her Hand.

THE *Circi* were large Structures either of an oblong or oval Form, built for the Celebration of various Games and Exerciſes, as we have heretofore obſerved; but of theſe there are ſcarce any Traces remaining. One may juſt diſcern indeed the Form of the *Circus Maximus*, which was built by *Tarquinius Priſcus*, and enlarged to ſuch a prodigious Extent by ſucceeding Princes, as to contain in their proper Seats two hundred and ſixty thouſand Spectators.

THERE are ſtill ſome Remains to be ſeen of ſeveral *Thermæ* or *Baths* of the ancient *Romans*; but the moſt conſiderable are thoſe of *Antonine* and *Diocleſian*. The Ruins of the former look more like thoſe of a Town than of a ſingle Fabrick; and thoſe of the latter are near a Mile in Compaſs, which is not to be wonder'd at, if we conſider, that they contain'd Room for three thouſand Perſons to bathe without ſeeing one another.

THE *Aqueducts* were ſome of the nobleſt and moſt uſeful Deſigns of the *Romans*, but of thoſe which convey'd Water to ancient *Rome* there are only ſome ſmall Parts remaining; except of that call'd *Aqua Virginis*, which being repair'd by Pope *Nicholas* V. is ſtill in Uſe, and known by the Name of *Fonte di Trivio*. The old Aqueduct, which *Paul* V. reſtored, brings Water from a Collection of Springs almoſt forty Miles diſtant from the City.

OF the *Mauſolea* or funeral Monuments of illuſtrious Perſons among the *Romans* there are few in *Rome* or its Neighbourhood that are remarkable enough to require a Deſcription. That of the Emperor *Adrian* is now a Part of the Caſtle of *St. Angelo*, but ſtripp'd of its Statues and other Ornaments.—The Tomb of *Caius*

Seſtius is a ſquare Pyramid of Brick, but cover'd over with white Marble; and is ſtill entire, having been repair'd by *Alexander* the Seventh. It is a hundred and twenty Feet high, and almoſt a hundred broad at the Baſe. We enter into it through a narrow Paſſage, which leads to a vaulted Room, where we yet diſcern the Figures of Women, Flowers, Veſſels, and other Ornaments painted on the Plaiſter.

THE Mention of theſe ſepulchral Monuments leads us to give ſome Account of the *Catacombs*, as they are call'd, which are a vaſt Number of ſubterraneous Alleys or Galleries in the Neighbourhood of *Rome*, that appear to have been ancient Repoſitories of the Dead, but whether originally dug by the Heathens or the primitive Chriſtians has been much diſputed by the Learned. Each Alley or Paſſage is about four Foot broad, and ſix or eight Foot high, and are not only carried on ſtrait forward to a ſurprizing Length, but have others running off every Way like ſo many Lanes or Streets of a City. On the Sides of theſe Alleys were the Niches or Graves wherein the dead Bodies were depoſited, which were laid lengthwiſe, three or four Rows one over another, parallel to the Alley. Each of theſe Graves was juſt capable of receiving one Body, and had its Mouth cloſed with large Tiles, and ſometimes Pieces of Marble cemented together in a curious Manner*.

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* Biſhop *Burnet*, who ſaw both the Catacombs of *Rome* and *Naples*, gives us a particular Deſcription of the lat-

On ſome few of theſe Tiles is found the Name of the deceaſed Perſon; but frequently a Palm-Tree, engraven or painted. In ſome Places there are little Grottos or Chapels hewn out of the Rock, going off from the common Gallery, which have Niches all round them, and are ſometimes adorn'd with old Moſaic Work or Painting: Theſe ſeem to have been the Burial-Places of particular Families.—As to the Opinion of the primitive Chriſtians digging theſe Caves, and not only burying their Martyrs there in Times of Perſecution, but aſſembling in them for the Performance of divine Service, it is highly improbable; for as it is not to be conceived how they could carry on ſuch a vaſt Work unknown to their perſecuting Governors, conſidering the Multitude of Hands that muſt have been employ'd, and the Mountains of Rubbiſh brought out of theſe prodigious Caverns, ſo likewiſe it is abſurd to think they could hold their Aſſemblies amidſt the

ter, which are much more lofty and ſpacious than the former, the Alleys being generally about twenty Foot broad, and fifteen high, and inſtead of three or four Rows of Niches, as in the *Roman* Catacombs, there are ſix or ſeven in thoſe of *Naples*. But the Biſhop ſaw no Signs of any thing intended to cloſe up theſe Niches when the Bodies were laid in them; ſo that they muſt have been very unwholeſome ſtinking Places, where ſome thouſands of Bodies lay rotting, without any thing to ſhut in ſo loathſome a Sight and Smell, for the Niches appear to be too low for Coffins.

Annoyance of ſo much Stench and Corruption*. It is therefore more reaſonable to ſuppoſe (with Proteſtant Writers in general) that the Catacombs were originally the common Sepulchres of the ancient *Romans*, and were not uſed after the Cuſtom of burning the Dead was introduced amongſt them, unleſs for Slaves and the meaner Sort of People†.

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[*] This is the Sentiment of the Biſhop lately mention'd, who tells us he found the Steams in the Catacombs of *Naples* ſo ſtrong, that though he was as little ſubject to Vapours as moſt Men, yet he had all the Day long, after he was in them, which was not near an Hour, a Confuſion and as it were a Boiling in his Head that diſorder'd him extremely; whence he infers, that if there is now ſo much ſtagnating Air there, it muſt have been much more ſenſible and intolerable whilſt vaſt Numbers of Bodies were rotting in the Niches.—The ſame Prelate is of Opinion, that the Catacombs were originally the Burial-Places of the ancient *Romans*; but he thinks it undeniable from genuine Inſcriptions that have been found in them, that they were uſed for the ſame Purpoſe by the *Chriſtians* of the fourth and fifth Centuries.

[†] Laying up the Bodies in Caves was a very ancient Way of diſpoſing of the Dead, and appears to have been propagated by the *Phœnicians* wherever they ſent their Colonies. When a Hero died or was kill'd in a foreign Expedition, it was uſual to burn his Body, in order to bring home the Aſhes, and thereby oblige the *Manes* to follow, that ſo his Country might not be deprived of the Benefit of his Tutelage. This Mr. *Monro* thinks was the Original of burning the Dead, which by degrees became common to all who could bear the Expence. As to the preſent Manner of Interment, it was firſt introduced by the *Chriſtians*.

HAVING ſaid ſo much of the Antiquities of *Rome*, we muſt be more brief on thoſe of other Parts of *Italy*; but ſome of them are too remarkable to be paſs'd over in Silence. The noble Amphitheatre at *Verona* is the beſt preſerved of any Structure of that Kind, the Inſide of it being ſtill almoſt entire. It is of an oval Figure, having forty four Rows of Seats of white Marble, placed one over another, each being about eighteen Inches high and as much in Breadth, ſo that the Whole would conveniently contain 23,000 Spectators.

THE City of *Rimini* ſtill ſhews ſeveral Monuments of its ancient Splendor, particularly a fine Marble Bridge of five Arches, begun by *Auguſtus* and finiſh'd by *Tiberius*. A Triumphal Arch built by *Auguſtus*, which is likewiſe of Marble, ſerves at preſent for one of its Gates, though Part of it is deſtroy'd. There is alſo a *Suggeſtum*, (looking much like the Pedeſtal of a Pillar) from whence *Cæſar* is ſaid to have harangued his Soldiers after he had paſs'd the *Rubicon*.

BUT perhaps no Part of *Italy*, except *Rome*, abounds more with Remains of Antiquity than the Neighbourhood of *Pozzuoli* and *Baia*, amongſt which are ſeveral Pillars ſtanding in the Bay, in a great Depth of Water, which are commonly reckon'd a Part of *Caligula*'s Bridge, though ſome of our moſt judicious Travellers have made it appear they ſupported the Arches of a ſtrong and ſtately Mole built for the Defence ſence and Convenience of the Harbour. Be this as it may, the Work muſt have been prodigious; as is alſo the *Piſcina mirabilis*, or *Wonderful Fiſh-pond*, which ſeems to have been a Reſervoir of Water, ſupported by eight and forty large Pillars all hewn out of the Rock. It is 150 Paces long, thirty high, and forty broad, and is laid over with old Plaiſter now as hard as Stone itſelf. Some aſcribe this Work to *Nero*, though others ſay it was built by *Agrippa*, to preſerve Water for the Uſe of his Navy.—The other Curioſities in this Neighbourhood are the *Centum Cameræ*, or *Hundred Chambers*, being a great Number of large Rooms cut out of a Rock, and cover'd over with Plaiſter; the Houſe and Sepulchre of *Agrippina* the Mother of *Nero*; that of *Virgil*; the Ruins of the Seat of *Hortenſius*, of an Amphitheatre and a Circus; the Grottos already deſcribed, and many others, on which we have not Room to enlarge.

BEFORE we leave this Subject we ought to take notice of the noble Remnant of the *Via Appia*, which runs along for about thirty Miles between *Rome* and *Naples*. This Highway, which was begun in the Conſulate of *Appius Claudius Cæcus*, from whom it takes its Name, extended quite from *Rome* to *Brunduſium*, (now *Brindiſi*) upwards of three hundred Miles, and was more frequented by Perſons of Quality among the ancient *Romans* than any other in *Italy*. It is twelve Foot broad, conſiſting chiefly of blue Stones of a cubical Form, each Side meaſuring a Foot and a half. The Strength of this Pavement appears from its long Duration, for it has now laſted above two thouſand Years, and is for ſeveral Miles together as entire as when it was firſt made.—The *Via Flaminia* was another famous Road of this Nature, extending Northwards from *Rome* to *Rimini*. Some Remains of it are ſtill to be ſeen, (but not ſo entire as the *Via Appia)* from whence it appears to have been paved with broad Flints and Pebbles, having on each Side a Border of Stone. —From this Account of the Antiquities of *Italy*, we proceed to deſcribe ſome of its Cathedrals and other Structures, which, compared with thoſe already mention'd, may be rank'd amongſt its modern

BUILDINGS.

THE Cathedral Church of St. *Peter* in *Rome*, after which Model St. *Paul*'s in *London* was built, is eſteem'd a Maſter-piece of modern Architecture, and ſtrikes the Spectator with Admiration and pleaſing Aſtoniſhment. The circular Area which lies before this magnificent Edifice is encompaſs'd by a beautiful Periſtyle or Colonnade, conſiſting of 284 Marble Pillars of the *Doric* Order, which ſupport an Architrave adorn'd with a vaſt Number of Statues of Saints and Martyrs. The Obeliſk already mention'd, and a fine Fountain on each Side of it, are great Additions to the Beauty of this ſpacious Court, from whence there is a Flight of Steps to a grand Platform or Terrace, that leads into the lofty Portico before the Church. Over this Portico, which is ſupported by Pillars three Fathoms in Circumference, are the Statues of our Saviour and the twelve Apoſtles; and there is a fine Balcony, wherein the Popes are crown'd in View of all the People. The Body of the Church, as well as the Cupola, which is adorn'd with curious Moſaic Work, is ſuſtain'd by large ſquare Pillars like thoſe of St. *Paul*'s; and under the Middle of the Cupola ſtands the High Altar, which has a Magnificence hardly to be parallel'd. It is ninety Feet in Height, being a Kind of Pavilion ſupported by four wreathed Columns of Braſs, adorn'd with Foliage, and on the Top of the Canopy are four Angels of gilt Braſs, holding Feſtons of Flowers moſt beautifully carv'd; and between them are Figures of Children playing on the Cornice. We aſcend to the Dome by a winding Stair-Caſe without Steps, and from thence to the Ball by Stairs not very commodious, which lie between the outer and inner Dome. The Height from the Pavement to the Top of the Croſs, which is over the Ball, is four hundred thirty-two Feet, and the Diameter of the Ball eight Feet four Inches. St. *Peter*'s Chair is all of Braſs gilt, and ſupported by four gigantic Figures, repreſenting four Fathers of the Church, with a gilded Glory over them reaching quite to the Roof. Under this Chair there is an Altar, and on each Side are ſtately Monuments of Braſs and Marble, of excellent Workmanſhip. It is ſcarce poſſible to deſcribe the Riches and Beauty of the little Chapels and Altars round this Church; in a Word, the Gilding, Carving, Paintings, emboſs'd Work, Braſs and Marble Statues, &c. are ſo well contriv'd and diſpoſed, that the Abundance occaſions not the leaſt Confuſion, nor does any thing appear ſuperfluous. But among all the Ornaments of this Cathedral, perhaps none deſerve our Attention more than the Moſaic Pictures*, which repreſent a great many

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* *Moſaic Work*, is an Aſſemblage of little Pieces of Glaſs, Marble, precious Stones, Woods, or the like, of various Colours, cut ſquare and cemented on a Ground of Plaiſter, &c. imitating the natural Colours and Degradations of Painting. In this Senſe it includes Marquetry or Inlaid Work, Vaneering, &c. but in its more proper and reſtrained Senſe it only takes in Works of Stone, Metals, and Glaſs, thoſe of Wood being diſtinguiſh'd by the Name of *Marquetry*. The Moſaic of Marble, which at preſent is moſt in Uſe, ſerves for the Pavements of Churches and Palaces, and the Incruſtation of the Walls of the ſame Edifices; but that of precious Stones is ſo expenſive, that it is ſeldom uſed unleſs in ſmall Works, ſuch as Ornaments for Altar-Pieces, rich Tables, &c. The Moſaic Work ſo much admired in St. *Peter*'s at *Rome* is done with colour'd Glaſs, which Kind, though now little uſed, is of a ſurprizing Durableneſs and Luſtre. It is laid on a Sort of Plaiſter compoſed of Lime, fine Brick-duſt, Gum-Tragacanth, the Whites of Eggs, and other Ingredients; the Pieces of Glaſs being ranged

Pieces of Scripture and Eccleſiaſtical Hiſtory, and exceed any thing of that Kind that ever was done by the Ancients.—What immenſe Sums this noble Fabrick and all its ſumptuous Ornaments muſt have coſt we leave the Reader to judge; and ſhall only add, that it was the Work of above a hundred Years, from the firſt laying of the Foundations to the Time of its Concluſion.

Next to St. *Peter*, the Cathedral Church of *Milan* is by ſome reckon'd the moſt magnificent Structure in *Italy*. It is a vaſt *Gothic* Edifice, about five hundred Feet in Length, and two hundred in Breadth, and is all of Marble. A hundred and ſixty Pillars of white Marble ſupport its ſtately Roof, each of them valued at ten thouſand Crowns. The Choir is wainſcotted, and adorn'd with beautiful Carv'd-Work repreſenting the Hiſtories of the Goſpel. The High Altar is very ſumptuous and ma-

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with ſo much Juſtneſs, and the Light and Shadow ſo well obſerv'd, that they appear as ſmooth as a Table of Marble, and as finiſh'd as a Painting in *Freſco*, with this Advantage, that they have a fine Luſtre, and will laſt almoſt for ever, whereas Time effaces all other Kinds of Painting. — There is another Sort of Moſaic Work, of a more modern Invention than any of the former, made with a Kind of *Gypſum* or *Talc* found in the Stone-Quarries near *Paris*. Of this Talc, calcined in a Kiln, beaten in a Mortar, and ſifted, they form a Sort of artificial Marbles, imitating precious Stones, and of theſe compoſe a Moſaic Work, little inferior to the natural Stones, either in point of Durableneſs or Vivacity.

jeſtic; and here are two noble brazen Pulpits, each of them running round a large Pillar like a Balcony, and ſupported by huge Figures of the ſame Metal. As to the Statues about this Church, their Number is prodigious, many of them as big as the Life, and ſome of exquiſite Workmanſhip; but thoſe who make them amount to eleven thouſand muſt include in the Computation every particular Figure in the Hiſtory-Pieces, and all thoſe ſmall ones that are frequently placed about the larger Statues.

THE Cathedral of *Florence* is one of the moſt ſuperb and beautiful Structures in *Europe*, the Walls and Pavement being of Marble of various Colours. It is four hundred and eighty Feet long, and three hundred and eighty Feet high to the Top of the Croſs. The Cupola is lofty and of a vaſt Circumference, being the firſt of the Kind that ever was built in *Europe*, from whence St. *Peter*'s at *Rome* was copied. The Painting on the Inſide of it repreſents the Reſurrection and the Laſt Judgment; and the Body of the Church is likewiſe adorned with the fineſt Paintings, Sculptures, and a vaſt Number of ſtately Monuments. The Bell-Tower or Steeple, detach'd from the Church, is much admired, being a hundred and eighty Feet high, all of fine Marble of ſeveral Colours, and adorn'd with a great Variety of curious Carvings and Figures. The Baptiſtery, which ſtands before the Church, was anciently a Temple of *Mars*, and is now remarkable for its three brazen Gates, on which ſeveral Pieces of Scripture-Hiſtory are ſo exquiſitely repreſented in Baſs-Relief, that *Michael Angelo* uſed to ſay, *they were good enough to be the Gates of Paradiſe**.

HERE we cannot forbear taking notice of the Chapel of St. *Laurence*, (adjoining to the Collegiate Church of the ſame Name) which is the Burial-Place of the *Medicean* Family, and is univerſally allow'd to be the fineſt and moſt coſtly Piece of Work in the whole World. This Chapel is an Octogon, having a ſpacious Cupola for its Roof, and its Walls are incruſted with Jaſper, Agate, *Lapis Lazuli*, Oriental Alabaſter, and other rich Materials. All round it are the Tombs of the Great Dukes of *Tuſcany*, compoſed of Porphyry, Granite, and the moſt precious Marbles; and on each Tomb is a Column of Jaſper, with a Ducal Crown on the Top of it, enrich'd with Variety of Jewels. Above theſe Tombs the Statues of the Great Dukes are placed in Niches, all of Braſs gilt, and large as the Life. In the Middle of each Face of the Octogon riſes a double Pilaſter of Jaſper, and on the Pedeſtal of each are ſeveral emblematical Figures, curiouſly wrought with precious Stones. The Pavement is of the fineſt Marble, and the Roof adorn'd with *Lapis Lazuli* of the brighteſt Blue, and ſpangled with Stars and Veins of Gold. This ſplendid and ſumptuous Structure was begun above a hundred Years ago, but is not yet finiſh'd, though it has already coſt many Millions Sterling.

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* Theſe Gates were the Work of *Laurentio Cion*, and took him up fifty Years in finiſhing. Biſhop *Burnet* ſays they are the beſt of the Kind in the World, and adds, that the Hiſtories are repreſented with ſo much Exactneſs, the Work is ſo natural, and yet ſo fine, that a curious Man might find Entertainment for many Days, if he would examine them with a critical Nicety.

THE Cathedral of *Piſa* is one of the moſt regular, beautiful, and lightſome Pieces of *Gothic* Building to be ſeen in *Europe*. The Choir is of the fineſt Marble, and the Roof is ſupported by eighty Columns of the ſame Stone, all of one ſolid Piece, being Part of the Spoils taken by the *Piſans* in their Eaſtern Expeditions, when the Republick was in a flouriſhing Condition. The Pavement is alſo of Marble, but of different Colours, curiouſly intermix'd; and the Paintings, eſpecially of the Choir, are done by the greateſt Maſters. The three Gates of this Church, which are of Braſs, are exquiſitely wrought with the Hiſtory of our Saviour's Birth, Life and Paſſion. The Baptiſtery is a fine Marble Structure, ſhaped like the Cupola of St. *Peter*'s at *Rome*, and ſupported by beautiful Pillars. But we muſt not forget the celebrated leaning Tower or Steeple, which is of a round Form, a hundred and eighty-eight Feet high, and was built ſo on purpoſe (as ſome ſay) to ſhew the Skill of the Architect. Others affirm that it only deceives the Eye, and is really upright; but the Truth is, one Part of the Foundation ſunk ſoon after the Tower was built, whence it acquired that Inclination ſo much talk'd of, which is not only viſible to the Eye, but has been often proved by letting down a Line and Plummet from the Top to the Bottom.

AMONGST the Cathedrals of *Italy*, that of *Sienna* in particular deſerves our Attention, which is really a Maſter-piece in the *Gothic* Kind, and may be view'd with Pleaſure after St. *Peter*'s itſelf. The Walls, both within and without, are faced with Marble of different Colours; and the Roof is Azure, ſprinkled with Stars of Gold. The Portico of this Church is very magnificent; and the whole Fabrick is adorned with Variety of excellent Statues, Buſts, *&c.* and particularly with the Heads of above a hundred and ſeventy Popes in Alabaſter. The Windows are form'd by a Multitude of little Pillars retiring one behind another, and the large Columns are carv'd with Fruit and Foliage from the Bottom to the very Top. But above all, the Pavement of the Church is exquiſitely fine, being compoſed of Marble of various Colours, forming a Sort of Moſaic Work, wherein is repreſented in a moſt lively Manner the Story of *Abraham* going to ſacrifice his Son, the Paſſage of the *Iſraelites* through the *Red Sea*, and other Hiſtories of the Old Teſtament. In order to preſerve this beautiful Work, they cover it with Boards, which are eaſily taken up to ſatisfy the Curioſity of Strangers.

It might perhaps be thought a blameable Omiſſion if we ſhould ſay nothing of the famous Church of St. *Mark* in *Venice*, which is built after the *Grecian* Manner, almoſt ſquare, and cover'd with four Domes or Cupola's; but it is neither very large nor lofty. The Whole is ſupported by thirty-ſix Pillars of fine Marble, a beautiful Baluſtrade runs round the Top of it, and the Frontiſpiece is adorn'd with Columns of Porphyry and Jaſper. The High Altar is a Maſter-piece of its Kind, and the Back of it is embelliſh'd with a vaſt Number of curious Pictures, enamell'd after the *Grecian* Taſte, ſet in Gold, and enrich'd with precious Stones. The great Quantity of Moſaic Work, with which the Roof and Pavement of this Church is adorn'd, is very much admired, having now laſted near ſeven hundred Years without any Diminution of its Beauty.

To the Churches already deſcribed we ſhall only add the Cathedral of *Loretto*, which is a moſt magnificent Fabrick, built in the Form of a Croſs, and adorn'd with a vaſt Variety of Statues and Paintings by the greateſt Maſters. The Cupola is a bold and lofty one, ſupported by twelve ſtately Pillars, which are cover'd with Paintings; and the Doors of the Church, which are ſaid to be of *Corinthian* Braſs[*], are curi-

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[*] This famous Metal is ſaid to have been form'd from the immenſe Quantities of Gold, Silver, and Copper, that were melted and run together by the Violence

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BIBLIOTHECA BODLEIANA

ouſly wrought with Baſs-Reliefs repreſenting ſeveral Pieces of Scripture-Hiſtory. But this Church is moſt famous for the *Santa Caſa* or *Holy Houſe*, which ſtands in the Middle of it, and occaſions a vaſt Reſort of Pilgrims from all Parts of *Europe**. This Houſe or Apartment is about thirty Feet long and thirteen broad, and the Walls appear to be of Brick cemented with common Lime and Sand; but as to the Roof and Pavement, they are acknowledged to be of modern Workmanſhip. At the Weſt End of it is a little Window; and at the Eaſt End, over the Chimney, is placed a Cedar-Statue of the Virgin, holding the Infant *Jeſus* in her Right Arm. The Statue is about

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of the Conflagration, when *L. Mummius* ſack'd and burnt the City of *Corinth*, 146 Years before the Birth of our Saviour.—Thoſe who ſpeak of it accurately diſtinguiſh it into three Kinds: In the firſt, Gold was the prevailing Metal; in the ſecond, Silver; and in the third, Gold, Silver and Copper were equally blended.

* We ſhall not trouble the Reader with a long Hiſtory of this *Holy Houſe*, but only inform him that it is ſaid to be the ſame in which the Bleſſed Virgin was born, where ſhe receiv'd the Salutation of the Angel, and brought up her Son *Jeſus* till he was twelve Years of Age: That when the *Turks* became Maſters of the *Holy Land*, it was tranſlated from *Nazareth* into *Dalmatia* by Angels, who afterwards carried it croſs the *Adriatic* into the Territory of *Recanati*, a few Miles from *Loretto*; from whence they ſoon removed it a third time, and laſtly fix'd it in its preſent Situation. To do Honour to this Houſe the ſtately Church was built, in which it now remains incloſed.

four Feet high, and uſually adorn'd with a Mantle of Gold Brocade embroider'd with precious Stones; and on its Breaſt hangs a rich Fleece of Jewels, with a Collar and Croſs of the ſame Materials. But the moſt ſplendid and coſtly of all the Virgin's Array is her triple Crown, which, with a little one for her Child, was preſented to her by *Lewis* XIII. of *France*. They are both of maſſy Gold, and are enrich'd with Diamonds of immenſe Value, which dazzle the Eyes of the Beholders. Round the Niche, wherein the Statue is placed, a Row of precious Stones of different Kinds is ſo diſpoſed as to form a Sort of Rainbow of various Colours. Twelve Lamps of maſſy Gold, ſaid to weigh thirty-ſeven Pounds each, hang before the Statue; and before the Altar hangs one of a much larger Size, remarkable for the Excellency of the Workmanſhip, which was a Preſent from the Republic of *Venice*. This Altar is of pure beaten Silver, preſented by one of the Dukes of *Tuſcany*.—As to the Treaſury of this celebrated Place, it is fill'd with Riches ſurpaſſing all Imagination. It is a long Room or Gallery, with a vaulted Roof adorn'd with excellent Paintings; on one Side whereof are ſeventeen or eighteen large Preſſes with Folding-Doors, the Repoſitories of Gold, Diamonds, and whatever elſe is valuable, being the Offerings of Emperors, Kings, Princes, *&c.* for ſeveral Ages paſt. Silver (as Mr. *Addiſon* obſerves) can ſcarce find Admiſſion here, and

Gold looks but poorly among ſuch an incredible Number of precious Stones. It is ſurprizing to ſee the coſtly Services for the Altar, conſiſting of *Lapis Lazuli*, Amber, Agate, Coral, and Cryſtal. In one Preſs there is a Spread-Eagle cover'd with Diamonds; in another the Images of our Saviour and the *Samaritan* Woman in Gold; and there is an Altar-Cloth enrich'd with Jewels, valued at a hundred and forty thouſand Crowns. In this Treaſury are likewiſe kept the rich Habits of the Virgin, of which ſhe has a Change at leaſt for every Day in the Year.—But it would be endleſs to enumerate all the valuable Curioſities that are heaped up here from all Parts of Chriſtendom; and having ſaid enough of the ſacred Structures, we proceed to give a brief Account of ſome of the fineſt Palaces in *Italy*

WE ſhall begin with the Pope's Palace of the *Vatican*, his uſual Reſidence, at leaſt in Winter; which, if not the moſt beautiful, is in ſome Reſpects the moſt celebrated in *Europe*. It ſtands near St. *Peter*'s Church, and is a very large and lofty Building, but extremely irregular; or rather it may be reckon'd a Heap of good Pieces of Architecture ill join'd together. Some affirm that it contains above twelve thouſand Rooms, Cloſets, *&c.* but of this we can ſay nothing with Certainty, though perhaps the Conjecture is not much beyond the Truth. It is ſufficient to ſay in general, that it is a Palace fit for the greateſt Monarch upon Earth;

and though the Outſide has nothing that raiſes our Admiration, the Inſide makes us ample Amends, for we are aſtoniſh'd at the Grandeur of the Apartments and the Beauty of the Paintings, wherein the greateſt Maſters of *Italy* have diſplay'd their Art. In the great Hall, or *Sala Regia*, where the Pope gives Audience to Ambaſſadors, there is an admirable Piece of the celebrated *Raphael*'s, repreſenting *Leo* in his pontifical Habit meeting *Attila* King of the *Huns*; and *Michael Angelo* has outdone himſelf in the Converſion of St. *Paul*. The ſame Hand has inimitably drawn the Laſt Judgment in a Chapel adjoining to this Hall, which is likewiſe admired for the Beauty of its Structure. The Pleaſure-Houſe, call'd the *Belvidere*, abounds alſo with excellent Paintings, and its Gardens are very delightful, being laid out in pleaſant Walks, and adorn'd with Fountains, Caſcades, Grottos, *&c.* together with a great Variety of antique Statues, many of them of excellent Workmanſhip, particularly that of *Venus* coming out of a Bath, a dying *Cleopatra*, and *Laocoon* with his two Sons and Serpents twiſting about them, cut out of one Block of Marble. But the famous Library, with the Building that contains it, engages the Attention of a Stranger more than all the other Beauties of the *Vatican*. The Structure is finely painted both within and without, and the Library itſelf is perhaps the nobleſt Collection in the World both of printed Books and Manuſcripts, eſpecially the latter, having been much augmented by the Library of the Elector Palatine from *Heidelberg*, that of the Duke of *Urbino*, and that of *Chriſtina* Queen of *Sweden*. A *Hebrew* Bible, the four Goſpels written by the Hand of St. *Chryſoſtom*, a *Virgil* and a *Terence* about fourteen hundred Years old, are to be ſeen amongſt the ancient Manuſcripts; of which indeed there is a ſurprizing Number, in *Hebrew*, *Greek*, *Latin*, *Arabic*, *Chaldean*, and ſeveral other Languages, ſome of them remarkable for the curious Manner in which they are written, and others for their Scarcity and Antiquity.

IT would take up too much Time to deſcribe the other Palaces belonging to the Pope, or to the noble Families in *Rome*, ſeveral of which are exceeding beautiful and magnificent. From this City therefore let us ſtep to *Florence*, and take a View of the ſtately Palace of *Pitti*, the uſual Reſidence of the Great Dukes of *Tuſcany*. This *New* Palace (as it is call'd) is built in the *Ruſtic* Manner, which, as well as the *Tuſcan* Order, owes its Original to this Country. The Front towards the Street has a Range of twenty-two large Windows in each Story, with fine Pillars on the Sides of them, and other proper Ornaments; but the Court or Area within is ſo ſmall, that one cannot ſtand in it conveniently to view the Building to the beſt Advantage. The Duke's Apartments are very richly furniſh'd, and adorn'd with exquiſite Paintings; but nothing in *Florence* is ſo much admir'd as the famous Gallery of the *Old* Palace, which is fill'd with a Collection of Pictures and Statues perhaps the moſt curious and valuable in the World. One Side of the Gallery is a continued Window, under which are ranged fine Marble Statues of the *Roman* Emperors and ancient Heroes, and above it are the Pictures of the moſt learned Men of different Ages and Countries. The oppoſite Side is cover'd with the Pictures of the *Medicean* Family, and thoſe of the moſt celebrated Generals, ancient and modern. Amongſt the Buſts of the Emperors are thoſe of *Caligula*, *Otho*, *Pertinax*, and ſeveral others, which are uncommon, and almoſt ſingular in their Kind; and many of thoſe which are more common deſerve particular Notice for the Excellence of the Sculpture, as thoſe of *Auguſtus*, *Veſpaſian*, and *Marcus Aurelius*. There is alſo an admirable Buſt of *Alexander* the Great looking up to Heaven, in whoſe Countenance the Sculptor ſeems to have expreſs'd his Concern for Want of new Worlds to conquer. The entire Figure of a *Veſtal* Virgin, with the ſacred Fire burning before her, is a curious Piece of Antiquity; and ſo is a *Morpheus* in Touch-ſtone*, being the Figure of a Boy aſleep with a Bundle of Poppies in his Hand, in which Manner that Deity is uſually repreſented by ancient Statuaries. There are likewiſe in this Gallery a *Narciſſus*, a *Flora*, a *Gladiator*, and many other Statues, to the Number of three hundred or upwards, valuable for their Antiquity and excellent Workmanſhip.—Nor is this all: There are ſix or ſeven Rooms adjoining to the Gallery, which are fill'd with all manner of Curioſities. One of them contains a Collection of Idols, Sepulchral Lamps, Taliſmans[*], Medals, and other Antiquities of the like Nature. Another, call'd the *Mathematical Chamber*, has a Globe and Sphere, each of them ſeven Feet in Diameter; and a third is cover'd with the fineſt Paintings. But the moſt valuable Things are kept in a Room that is commonly ſhewn laſt to Strangers, over which is a little Dome or Cu-

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* This is a black, ſmooth, gloſſy Kind of Marble, formerly found in *Lydia* and *Ethiopia*, and call'd by the Ancients *Lapis Lydius* and *Baſaltes*. According to *Pliny*, the famed Statue of *Memnon* at *Thebes* was made of this Stone, and moſt of the antique *Egyptian* Figures are

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apparently of the ſame. It is call'd *Touch-ſtone* by the Moderns, as being uſed in trying the Goodneſs of Gold and Silver.

[*] *Taliſmans* are the Figures of the heavenly Signs, Conſtellations, or Planets, engraven on Stone or Metal, to which ſome Aſtrologers aſcribe wonderful Virtues, particularly that of drawing down the Influence of the celeſtial Bodies. There are alſo magical Taliſmans, which bear very extraordinary Figures, with ſuperſtitious Words and Names of Angels. The ancient Taliſmans of the *Samothracians* were Pieces of Iron form'd into Images and ſet in Rings, which were reckon'd Preſervatives againſt all Evils. Some Rabbins maintain, that the brazen Serpent raiſed by *Moſes* in the Wilderneſs was a Taliſman.

pola lined with Mother of Pearl, and the Floor is inlaid with Marble of various Colours. Here is the ſamous large Diamond, weighing 139 Carats, and reckon'd worth about 200,000l. Sterling. Here is alſo a Cabinet full of Veſſels of Agate, Cornelian, Porphyry, Coral, Rock-Cryſtal, *&c.* and a large Table inlaid with Oriental Jaſper, Rubies, Topazes, and other precious Stones. This Room likewiſe contains a great Variety of ſelect Pictures and Statues, and amongſt the latter is the celebrated one of *Venus*, (commonly call'd *Venus* of *Medicis)* the delicate Shape and Beauty whereof charm every Spectator, and are confeſſedly beyond Deſcription.

HERE it may not be amiſs to take notice of one of the Duke's Country-Palaces call'd *Pratolino*, not ſo much on account of the Structure itſelf, (though very grand and beautiful) as to give the Reader a Specimen of the fine Water-Works of the *Italians*, for which they have a peculiar Taſte, and which are no where ſeen in greater Perfection than in the Gardens of this Ducal *Villa*. Here is a noble Grotto, of which the Roof alone is ſaid to have coſt thirty thouſand Ducats, being all of Coral, Mother of Pearl, and other coſtly Materials. The Walls are lined with the ſame, and the Pilaſters are adorned with an Organ, which by means of Water plays ſeveral Tunes*, whilſt the God

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* *Hydraulic Organs*, which play by means of Water, are to be ſeen in ſeveral Grottos in *Italy*, from whence they

Pan joins his Pipe to the Muſick, and is anſwer'd by the Warbling of a great Variety of artificial Birds. In the Baſon there is a large Dolphin carrying a naked Woman on his Back, and ſwimming about, with ſeveral other Figures, all moving as if alive. In another Grotto *Galatea* comes out of a Door in a Sea Chariot, and returns again the ſame Way, after having ſail'd a while upon the Water. In one Place an Angel gives us a Tune upon a Trumpet; in another a Clown carries a Diſh of Water to a Serpent, who lifts up his Head and drinks it: Here Smiths are at Work, there Mills are going; and a great many other Curioſities of this Kind, all moved by Water, may be ſeen in the Grottos of theſe delightful Gardens.

PERHAPS we have dwelt too long on the Subject of Buildings, but we cannot leave it without mentioning a Nobleman's Seat about two Miles from *Milan*, which produces ſuch a ſur-

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have been introduced into *France* and ſome other Countries. The Invention however is not modern; for *Cteſibus* of *Alexandria*, who lived in the Reign of *Ptolemy Euergetes*, is ſaid to have firſt contrived Organs that play'd by compreſſing the Air with Water, as is ſtill practiſed. *Archimedes* and *Vitruvius* have left us Deſcriptions of the Hydraulic Organ; and we find the Figure of one on the Reverſe of a large Medallion of *Valentinian*, with two Men, one on the Right, the other on the Left, ſeeming to pump the Water which plays it, and to liſten to its Sound. It conſiſts of eight Pipes, placed on a round Pedeſtal.

ſurprizing Echo as can ſcarce be equall'd in the World*. Mr. *Addiſon* tells us, that upon firing a Piſtol he had the Sound return'd fifty-ſix times, though the Air was then foggy, and therefore not proper for making the Experiment to the beſt Advantage. At firſt the Repetitions were very quick, but the Intervals were greater in Proportion as the Sound decay'd. Nothing like ſuch an Echo, it ſeems, was deſign'd by the Architect, but is occaſion'd by two parallel Walls of a conſiderable Length, between which the Sound is reverberated from one to the other till the Undulation is quite ſpent.—Others tell us, that the Sound of one muſical Inſtrument in this Place will ſeem like a great Number of Inſtruments playing together in Concert.

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* This Echo is of the *multiple* or *tautological* Kind, returning one Sound ſeveral times ſucceſſively, ſo as to make one Clap of the Hands ſeem like many, one Ha like a Laughter, or one Inſtrument like ſeveral of the ſame Kind imitating each other: And by placing certain echoing Bodies in ſuch a Manner that any Note play'd ſhall be return'd in Thirds, Fifths, and Eighths, a muſical Room may be ſo contrived, that not only one Violin play'd therein ſhall ſeem many of the ſame Sort and Size, but even a Concert of different Inſtruments.—Thoſe Echoes which return the Voice but once are call'd *ſingle*; whereof ſome are *tonical*, only returning a Voice when modulated into ſome particular muſical Tone. Others, that repeat many Syllables or Words, are term'd *polyſyllabical*; of which Kind is the fine Echo in *Woodſtock* Park, which Dr. *Plott* aſſures us will return ſeventeen Syllables diſtinctly in the Day-time, and in the Night twenty. *Barthius* likewiſe, in his Notes on *Statius*'s *Thebais*, mentions an Echo near *Bingen* in *Germany*, which would repeat Words ſeventeen times, as he himſelf had proved; and what is very ſtrange in this Echo, the Perſon who ſpeaks is ſcarce heard at all, but the Repetition moſt clearly, and always in ſurprizing Varieties, the Echo ſeeming ſometimes to approach nearer, and ſometimes to retire to a greater Diſtance.—*Vitruvius* tells us, that in ſeveral Parts of *Greece* and *Italy* there were brazen Veſſels artfully ranged under the Seats of the Theatres, to render the Sound of the Actors Voices more clear, and make a Kind of Echo; by which means, of the prodigious Number of Perſons preſent, every one might hear with Eaſe and Pleaſure.

WE ſhall conclude this Article with a ſhort Deſcription of the famous Bridge at *Venice* call'd the *Rialto*, which is allow'd on all Hands to be one of the fineſt in *Europe*. It was built in the Year 1591, on the Deſign of the celebrated *Michael Angelo*, and is ſaid to have coſt 250,000 Ducats. It conſiſts of one ſingle Arch, all of Marble, has Rails on each Side, and two Rows of Shops in the Middle. The Dimenſions of this Bridge are as follows: The Compaſs of the Arch is juſt one third Part of a Circle; the Width of it on the Level of the Water, from one Extremity to the other, is ninety-five Feet, and the Height of it twenty-four. —Many other fine Structures of this Kind might be mention'd, but leſt we ſhould tire the Reader, and exceed our Limits, we muſt proceed to another Subject.

ARTS, MANUFACTURES, *&c.*

OF all the Manufactures of *Italy*, that of Silk may be reckon'd the principal, which employs a vaſt Number of Hands in *Genoa*, *Milan*, *Bologna*, *Venice*, *Florence*, *Lucca*, *Naples*, and other Cities. *Genoa* is particularly remarkable for its Velvets, Gold and Silver Brocades, fine Point, (or Lace wrought with a Needle) and alſo for its Paper, of which large Quantities are ſent to *England*; but the late War, in which the Republick was unhappily engaged, has been a great Interruption to her Commerce and Manufactures.

THE Artificers of *Milan*, beſides their wrought Silks, are famous for their Hard-Wares; and their Works in Cryſtal, of which they ſometimes make Looking-Glaſſes eighteen Inches long, are very much admired. *Breſcia* ſeems pretty much to reſemble our *Birmingham*, being the moſt noted Town in *Italy* for its Manufactures of Iron and Steel, eſpecially Fire-Arms. They alſo make abundance of Swords, Knives, and all Sorts of Cutlery-Ware; and their Manufacture of Linen-Cloth is not inconſiderable.

THE Duchy of *Parma* was formerly famous for its fine Cheeſe, call'd *Parmeſan*, which was in high Requeſt all over *Europe*; but it is now far outdone by the Territory of *Lodi*, where they breed great Numbers of Cattle, and make excellent Cheeſes of a monſtrous Size, ſome of them being as big as a Mill-ſtone, and weighing above five hundred Pounds. The *Lodeſan* is alſo noted for a fine Sort of earthen Ware, not inferior to that of *Delft* in *Holland.*

THE *Venetians* for a long Time excell'd all *Europe* in the Glaſs Manufacture, and were eſpecially famed for making the beſt Looking-Glaſſes in the World; but the *Engliſh* and *French* have found out the Art of making them to much greater Perfection. Their celebrated Glaſs-Houſes, from whence *Europe* uſed to be ſupplied, are at a little Town call'd *Murano*, on an Iſland about a Mile from *Venice*; and though the Demand they have for this brittle Commodity be not near ſo great as formerly, they are ſtill ſuppoſed to vend annually as much as amounts to 200,000 Crowns. It muſt be acknowledged they are very dextrous in working the Glaſs into all manner of Forms, ſuch as Ships with their Guns and Rigging, Caſtles with their Cannon mounted, Draw-bridges, Gates, &c. and little Organs that will make tolerable Muſick.—As to the Method of caſting *Plate-Glaſs* or *Looking-Glaſs*, which is practiſed by the *Engliſh* and *French*, it has been deſcribed in a former Chapter; and perhaps the Reader will not be diſpleaſed to have a ſhort Account of the Manner of blowing *Round Glaſs*, under which Name is comprehended our

Drinking-Glaſſes, Bottles, Bowls, and other Veſſels.

WHEN the Matter contain'd in the Melting-Pots is ſufficiently vitrified, the Operator takes his Blowing-Iron, which is a hollow Tube about two Foot and a half long, dips it into the Pot, and there turns it round; by which means the Metal ſticks to the Iron, like a glutinous or clammy Juice. For each Glaſs or Veſſel he dips four times, and at each Dip rolls the End of his Inſtrument, to which the Glaſs adheres, on a Piece of Iron placed over a Veſſel of Water, the Coolneſs whereof more readily conſolidates the Glaſs, and diſpoſes it to bind the better with the Matter taken out by the next Dip of the Inſtrument. Having taken up Matter enough by theſe Dippings, the Workman begins to blow gently through the Iron, by which he raiſes or lengthens it much like the blowing up a Bladder; and to give it a Poliſh, he rolls it to and fro on a ſmooth Stone or Marble. This done, he blows a ſecond time, and forms the Bunch or Belly of the Veſſel, the Matter aſſuming the Figure of a Gourd, twelve or eighteen Inches in Diameter. The Blowing is repeated as often as the Operator thinks neceſſary; and in order to lengthen and cool the Glaſs, he frequently whirls the Iron round his Head. When the Veſſel is blown into this Form, it is ſometimes return'd to the Fire, where it flattens a little of itſelf; after which it is taken out and cooled, and if the Deſign re-

require it, the Workman flats its Bottom by preſſing it on the Marble, or moulds it in the Stamp-Irons. To diſengage the Veſſel from the Inſtrument, they drop ſome cold Water on the Collet or Neck, which is the narrow Part that cleaves to the Iron; and this making a ſmall Crack, the Fracture by a ſlight Blow is communicated quite round the Collet. This done, they dip an Iron Rod in the Melting-Pot, and with the Matter that ſticks to it they apply and faſten it to the Bottom of the Veſſel, which thus ſuſtain'd is carried to the great Bocca or Aperture of the Furnace to be heated, where it is left to the Care of another Perſon, whilſt the former Operator reſts and prepares himſelf for the Branching. To branch or make the Bowl, they thruſt in an Iron Inſtrument, and the Aperture thereby made is widen'd by a ſecond, which is turn'd about to give the Veſſel its proper Form. What is ſuperfluous they cut off with Shears; and when the Veſſel is thus opened, they carry it again to the great Bocca, where being ſufficiently heated a ſecond time, the Workman puts a finiſhing Hand to the Bowl by turning it with a circular Motion, which he increaſes in proportion as the Bowl opens and enlarges. Nothing now remains but to place it in the Leer-Furnace to anneal and harden *.

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* From this Deſcription the Reader may form ſome Idea of the Manner of blowing Glaſs-Veſſels of different Kinds, but the Dexterity and Expedition with which

We read of a very ſingular and curious Manufacture of what they call *Sea-Wool* or *Fiſh-Wool*, made at *Reggio* in *Calabria*, and alſo at *Palermo* and other Towns in *Sicily*. On thoſe Coaſts they take a large Kind of Muſcle, whoſe Shell (according to *Martiniere*) is cover'd with Hair, which being ſoaked and waſhed in freſh Water, is carded, ſpun, and knit into Stockings, Caps, Gloves, Waiſtcoats, and other

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the Work is perform'd can only be conceiv'd by ſeeing the Operation. It is really ſurprizing to obſerve, how the melted Matter obeys the Blaſt of the Artiſt; how it ſwells, ſpreads, and forms itſelf into a Bottle, a Bowl, a Cup, or other Veſſel; how he turns it and twiſts it, makes it round as a Ball, or flat as a Wafer; how he cuts it with Sciſſars like a Piece of Cloth, and in ſhort faſhions it into a thouſand pretty Fancies, or into convenient neat Vaſes for preſerving Liquors, for which Purpoſe it ſervers better than the moſt precious Metals.—The various Uſes of Glaſs are almoſt innumerable, but one of the moſt common, and perhaps the moſt ſerviceable of all, is that of making Windows to our Houſes. Inſtead of ſplitting Stone into thin *Laminæ* or Plates, in order to render it tranſparent, as was the Practice of the Ancients; inſtead of uſing Canvas or Linen, which intercepts our View and hinders the free Tranſmiſſion of the Light; or inſtead of making Lattices, which leaves us expoſed to the Cold, Wind, and Rain; how much more convenient is it (as an ingenious Author obſerves) to have Windows of Glaſs, which, though ſufficiently denſe and compact to defend us againſt the Inclemency of the Weather, are ſo pellucid as to tranſmit to us in the Middle of our Houſes the chearful Blaze of Day without any Diminution of its Luſtre, and to lay open to our Sight the whole Proſpect of Nature!

Sorts of Apparel; which, though lighter than Silk or Cotton, are conſiderably warmer. But we rather apprehend (from other Accounts) that the Shell of this Fiſh is not hairy, but that the Animal ſhoots out a great many fine Threads or Strings from its Tongue, whereby it faſtens itſelf to the Rocks or Sand, and of theſe Threads the *Sicilians* form Stuffs of incomparable Beauty.

As it is one Part of our Deſign to take notice of the moſt remarkable Diſcoveries made by the Inhabitants of the Countries we ſpeak of, it ſeems proper, before we leave *Italy*, to give a ſhort Account of the Diſcovery of *America* by the famous *Chriſtopher Columbus*, a Native of the State of *Genoa*. This brave Adventurer, who was well ſkill'd in Aſtronomy, Geography, and Navigation, had long form'd a Reſolution of ſailing in Search of a Country beyond the *Atlantic* Ocean, and had made Application to ſeveral *European* States and Princes, particularly our *Henry* VII, to grant him ſome Ships and Money to proceed on his intended Voyage. After many Solicitations he at length obtain'd the deſired Aſſiſtance from *Ferdinand* and *Iſabella*, then King and Queen of *Spain*, who provided him with Money to fit out three ſmall Ships for the Expedition. This little Squadron, mann'd only with ninety Men, ſet Sail from *Palos* in *Andaluſia* on the third of *Auguſt* 1492, arrived at the *Canaries* the twelfth, and left thoſe Iſlands the firſt of *September*, directing their Courſe to the Weſtward. But they had not ſail'd above a Fortnight in this wide Ocean before the Men began to murmur; for obſerving the Wind to ſet conſtantly from Eaſt to Weſt, they apprehended there would be no Poſſibility of returning, and therefore concluded they muſt inevitably periſh if they miſs'd the Land they were made to expect. Their Fears however were in ſome meaſure diſſipated on the nineteenth, when they obſerved ſome Birds flying over their Ships, and ſaw abundance of Weeds driving by them on the twenty-ſecond. Having continued their Courſe Weſtward for ſome time longer, and meeting with no Land, the Seamen began again to mutiny, and were near upon reſolving to throw their Admiral over-board, and endeavour to return to *Europe*; but happily for *Columbus*, they were once more pacified by ſeeing Birds, Weeds, and even a Shrub with Berries upon it ſwim by them, which gave them freſh Hopes the Land was at no great Diſtance. Accordingly, on the eleventh of *October*, about Ten at Night, the Admiral firſt diſcover'd a Light upon the Iſland of *Guanahani*, or *St. Salvador*, which laſt Name he gave it in conſideration that the Sight of it deliver'd him and his Men from their Fears of periſhing. In the Morning the Ships anchor'd near the Iſland, which the Natives beheld with the greateſt Aſtoniſhment, whilſt the Admiral went aſhore in his Boat, and took Poſſeſſion of the Country in the Name of their Catholic Majeſties.

jeſties. The poor People were extremely pleaſed with the Beads and other Toys the *Spaniards* diſtributed amongſt them, and follow'd *Columbus* and his People wherever they went, ſeeming to adore them as if they were come from Heaven. From this Iſland they ſail'd to *Cuba* and *Hiſpaniola*, whence they departed for *Europe*, and arrived at *Palos* on the thirteenth of *March* 1492-3, where a ſolemn Proceſſion and Thankſgiving was made for their Return, and the Admiral was received by their Catholic Majeſties with the greateſt Honours.—*Columbus* afterwards made two Voyages to this New World, which yet has not taken its Name from him, as one might naturally expect it would have done, but from *Americ Veſpuſio*, a *Florentine* by Birth, who was ſent in 1497 by *Emanuel* King of *Portugal*, to continue the Diſcoveries begun by *Columbus*[*].

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[*] Though the Honour of the firſt Diſcovery of *America* ought undoubtedly to be given to *Columbus*, we muſt allow a proper Share to the ſeveral ſucceeding Adventurers, and amongſt the reſt to *John Cabot*, who was employ'd by *Henry* the VIIth of *England*, and in the Year 1497 diſcover'd *Newfoundland*, and ſail'd along the Coaſt of *America* as far as the Cape of *Florida*. And hence it appears, that whatever Right the *Spaniards* may pretend to that Part of the New World, the *Engliſh* have a Right equal if not ſuperior to theirs; even ſetting aſide their Claim to a Diſcovery much earlier than that of *Columbus* himſelf, by a *Welſh* Prince named *Madoc*, whoſe Ship was accidentally caſt upon the *American* Coaſt in the twelfth Century; which Story, though treated by many as fabulous, ſeems not to be without Foundation.

It is now time to paſs the *Alps*, (though we could not eaſily leave *Italy* ſooner) and take a View of what is moſt curious in the Empire of *Germany*, in which we ſhall include *Hungary* and other Dominions belonging to the Houſe of *Auſtria*, as alſo *Switzerland*, which laſt Country would ſcarce furniſh Matter enough for a ſeparate Chapter.

CHAP. V.

Of GERMANY *and* SWITZERLAND.

SPRINGS, CATARACTS, LAKES, MOUNTAINS, *&c.*

WE are now entring into Countries which abound with Mineral Waters of various Qualities; but of all the Springs of this Kind none ſeem to have gain'd a greater Reputation than thoſe of *Spa* or *Spaw* in the Biſhoprick of *Liege*, which are not only reſorted to by People from moſt Parts of *Europe*, but great Quantities of the Water ſeal'd up in Bottles are ſent into other Countries, eſpecially *Holland* and *England*. There are five Springs in the Town and its Neigbourhood which are more frequented than the reſt, but the Waters of the *Pouhon* Spring in the Market-Place are moſt eſteem'd, being preferr'd by our greateſt Phyſicians to all the Mineral Waters in or near the Biſhoprick. They promote Digeſtion, remove Obſtructions, ſtrengthen the Tone of the Viſcera, and are efficacious in ſeveral chronical Diſeaſes. The *Capuchins* have a fine Monaſtery at *Spaw*, and large Gardens, where the Company walk that drink the Waters, the Seaſon for which are the Months of *June*, *July*, and *Auguſt*.

THE celebrated Springs of *Pyrmont* are much of the ſame Nature with thoſe of *Spaw*, and are even preferable in many Caſes; but neither theſe nor any other Mineral Waters ſhould be indiſcreetly uſed without conſulting a Phyſician. At the proper Seaſon there is a great Reſort of the Nobility of *Germany*, as well as others, to drink the *Pyrmont* Waters, which are alſo exported abroad in large Quantities from *Bremen*, to which Place they are carried by the River *Weſer* *.

As the Waters of *Spaw* and *Pyrmont* are in greateſt Repute for drinking, ſo thoſe of *Aix la*

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* It appears from the *Philoſophical Tranſactions*, N°. 448, that in calm dry Weather and a clear Sky, there ariſes from the *Pyrmont* Springs a ſulphureous Steam, which ſuffocates Birds that approach it; and Ducks, that ſwim in a large Spring commonly uſed for Bathing, can ſcarce hold out a few Moments in this Steam, but die away immediately.

Chapelle (or *Aken*) are perhaps the moſt noted for bathing of any in *Germany*, being much frequented by the *Engliſh* and other Nations. The principal Baths in the Old Town are the *Emperor*'s, the *Little Bath*, and that of *St. Quirinus*, in the firſt of which the Emperor *Charlemagne* took delight to bathe with his Sons and Nobles, being then all in one, whereas it is now divided into ſeveral Apartments. The Springs that fill theſe Baths riſe ſo hot, that they let them cool ten or twelve Hours before they are uſed. They are impregnated with Nitre and Sulphur, are at firſt unpleaſant to the Taſte, and of a diſagreeable Smell. Thoſe in the New Town, which are the *Roſe Bath*, the *Poor's Bath*, and *St. Corneille's*, are not ſo hot and clear as the former, but with reſpect to their Smell and Taſte there is not much Difference. Near the hot Springs lie ſeveral cold ones, and there is one moderately warm, much reſorted to in Summer Mornings, and drank for chronical Diſeaſes.—Dr. *Blondel*, who in a printed Diſcourſe has made a Compariſon between the Waters of *Bath* in *England* and thoſe of *Aix-la-Chapelle*, ſays that bathing in the latter is good againſt Convulſions, Palſies, Numbneſs, Tremblings, Gout, Sciatica, the Diſeaſes peculiar to Women, nephritic Diſorders, and to carry off the Dregs of bad Mercury made uſe of in venereal Caſes. Though they are propereſt for Bathing, they are alſo drank in ſeveral Diſtempers with Succeſs, particularly in Obſtructions of the Liver, Spleen, and Reins, and in the Scurvy, Jaundice, and Dropſy. They are excellent againſt ſtubborn Fevers, Agues, inveterate Cholicks, Aſthmas, and cutaneous Diſeaſes; they purge the urinary Veſſels, diſcharge Gravel, relieve Melancholy, and are ſerviceable in various other Caſes, not neceſſary to be here enumerated.—In a Village juſt out of the Town are many other hot Baths, the Water of which is clear and pleaſant, without any diſagreeable Smell; and here People of all Ages and Conditions bathe freely, not only for Health, but for Diverſion. The Springs of this Village and thoſe of the City are ſo plentiful, that it is computed they yield every Day ſix thouſand Tuns of Water. The firſt Seaſon for theſe Baths begins in *May*, the ſecond in *Auguſt*.

THE Town of *Baden* in *Switzerland* has been long famous for its Hot Baths, and to them it chiefly owes its flouriſhing Condition. They are about half a Mile below the Town, and are ſupplied from ſeven Springs by the Side of the River *Limmat*, whoſe Waters contain a great deal of Sulphur, with a Mixture of Alum and Nitre. They are uſed for drinking as well as bathing, and are recommended for the Cure of Fevers, Aſthmas, Pains in the Head, Diſorders in the Breaſt and Bowels, and particularly for the Diſeaſes to which Women are ſubject.

THE Hot Baths of *Baden* in *Swabia*, whoſe Waters proceed from Rocks of Salt, Alum, and Brimſtone, are reckon'd an infallible Remedy for the Cramp, Gout, and other nervous Diſtempers, on which account they are much frequented. Some of them are very hot, particularly one call'd the *Kettle*, the Water whereof boils and ſmoaks as if it were over a Furnace.—There is another Town of the ſame Name in *Auſtria*, whoſe Hot Waters are reſorted to ſeveral Months in the Year for Bathing; and the *German* Phyſicians recommend them, if drank in time, for the Gout, Dropſy, and other chronical Diſeaſes*.

WE might mention a great many other Towns in the Countries we are treating of, that are remarkable for their medicinal Waters, but one more ſhall ſuffice, namely, *Buda* in *Hungary*. The Baths of this City (according to Dr. *Brown*) are the fineſt in *Europe* for plentiful Springs and magnificent Buildings. Some of the Waters are fit either for Bathing or Drinking, but ſeveral are ſo hot that they cannot be uſed without conveying them to cool in other Baths, or mixing them with cold Water. They have a ſulphureous Smell, and are of a petrifying Quality. Here is a cold Bath ſo near to a hot one, that a Man may put his

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* *Chronical* is a Term applied by Phyſicians to a ſlow Diſeaſe, which laſts a long time, as an Aſthma, Dropſy, &c. In oppoſition to which, thoſe which are ſpeedy and haſten to a Criſis, ſuch as Fevers, Small-Pox, &c. are call'd *acute* Diſeaſes.

Hand from one into the other.—It is ſaid here are Fiſh in ſome Baſons or Ponds of hot Water, which being thrown into the neighbouring *Danube*, or other cold Water, die immediately.

IN the *Philoſophical Tranſactions* we have an Account of a ſtrange Spring near *Paderborn* in *Weſtphalia*, which loſes itſelf twice in twenty-four Hours, but returns with a great Noiſe, and with ſuch Force, that the Stream turns three Mills a little below; for which Reaſon it is call'd the *Bolder Born*, or *Boiſterous Spring*.—There is alſo an Account of another remarkable Spring near the ſame City, which ſends forth three Streams at a little Diſtance from each other; one of which is limpid, blueiſh, lukewarm, and impregnated with Vitriol, Alum, Sulphur, and other Minerals; the ſecond with much the ſame Taſte, but turbid, whitiſh, and cold as Ice; and the third taſting both ſour and ſweet, but very clear, and of a greeniſh Colour.

THE *Danube*, the moſt conſiderable River in *Europe*, takes its Riſe in the *Black Foreſt* in *Germany*, from whence, to its Fall into the *Black Sea*, it performs a Courſe of above 1500 Miles at a moderate Computation, without including its Windings and Turnings. It has ſeveral remarkable *Cataracts*, which is the Name we give to thoſe Places in a River where the Water falls down a Rock or Precipice with great Noiſe and Impetuoſity. The moſt remarkable of theſe Cataracts are the *Saw Ruſſel*, or *Swine's Snout*, near *Lintz*, ſo call'd from a prominent Rock, which has under it a dangerous Whirlpool; and another call'd *Der Strudel*, where the falling of the Water makes a dreadful Noiſe.

THE *Rhine*, another noble River, has alſo its Navigation interrupted by ſeveral Cataracts, the moſt dangerous whereof are two in *Switzerland*; the one near *Schaffhauſen*, where the whole River falls ſeventy or eighty Foot; the other at *Lauffen*, about a League below; where the Water is precipitated down the Rocks with ſuch a prodigious Violence, that the Noiſe may be heard, in a calm Night, at the Diſtance of twelve or fifteen Miles. Here the Goods put on ſhore at *Schaffhauſen*, and brought hither by Land, are taken in by other Veſſels to proceed down the River.

BUT after all that we have ſaid concerning the Springs and Rivers of *Germany*, perhaps none of the natural Curioſities of that Country is more ſurprizing than the *Zirchnitzer Sea* or Lake in *Carniola*, ſo call'd from the neighbouring Town of *Zirchnitz*.—This Lake is four or five Miles in Length, and about two in Breadth*, ſurrounded at ſome Diſtance with woody Mountains, which are full of Deer, Wild Boars, Hares, and other Game. In the Month of *June*, *July*, or *Auguſt*, the Water of this Lake ſinks under Ground through many large Holes at the Bottom, leaving it quite dry till *October* or *November*, at which Time it commonly returns, ſpouting out of the ſame Holes with ſuch Violence, that it ſometimes covers the whole Vale in twenty-four Hours, though at other times it has been known to be three Weeks in filling; but it is a conſtant Obſervation that Thunder and Lightning contribute much to fill it ſpeedily. The Water however, with reſpect to its Retreat and Return, does not obſerve any certain Period, for ſometimes the Lake has been dry twice or thrice in a Year; ſometimes again, though ſeldom, it has happen'd to be three or four Years together full of Water, but was never known to be dry for a whole Year together. The principal Pits or Holes through which the Water retires are eighteen in Number, and at theſe Holes the Fiſhermen lay their Nets, and take vaſt Quantities of Fiſh, which would otherwiſe be carried under Ground with the Water. The Prince of *Eckenberg*, who is Lord of this Lake and the adjacent Country, will permit no body to fiſh in it when it is full; but when a certain Stone appears, which ſhews that the Water is ſinking, all thoſe who have a Right of fiſhing have Notice given them to prepare for their Buſineſs. The Pits grow dry one after another, according to their Situation, and the loweſt of them is generally evacuated in twenty-five Days from the Beginning of the Receſs of the Water, which is the Time the Fiſhing continues. When it is over, a Signal is given by tolling a Bell, upon which all the Inhabitants of the neighbouring Villages, and of *Zirchnitz*, without Diſtinction of Age or Sex, go for the moſt part ſtark-naked into the Lake, and look for Fiſh among the Weeds and Sedge and in the ſmaller Pits; and many of them find abundance of large Fiſh by creeping into the ſubterraneous Caverns and Paſſages. The Fiſh taken here, which are well-taſted, are chiefly Eel-pouts, ſome of them weighing two or three Pounds; Tench, ſome weighing ſix or ſeven Pounds; and Pikes in great Plenty, of ten, twenty, thirty, or even forty Pounds; and it is uſual to find whole Ducks in the Bellies of the latter: Large Crabs are alſo found in ſome of the Pits, but they are ill-taſted.

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* This is agreeable to M. *Valvaſor*'s Account in the *Philoſophical Tranſactions*, but Dr. *Brown* gives the Lake almoſt double theſe Dimenſions: There is alſo ſome little Difference between theſe Gentlemen with reſpect to the Time of the Waters ſinking and riſing again, which the Doctor fixes abſolutely to the Months of *June* and *September*.

THE Lake, being thus alternately wet and dry, is of great Service to the neighbouring Inhabitants; for while it is full of Water, it is frequented by Wild-Geeſe, Wild Ducks, Swans, and other Fowls; and when it is empty, it affords them Graſs for the preſent Suſtenance of their Cattle and Hay for the Winter. After the Hay is got in, they plow the Ground and ſow Millet, which is ſometimes deſtroy'd by the too ſudden Return of the Water, but generally comes to Maturity. Whilſt the Millet is on the Ground they catch a great Number of Quails, and all the Time the Lake is dry they have the Diverſion of hunting and killing the Game that reſorts to it from the adjacent Woods and Mountains. Laſtly, when the Water retires they take abundance of fine Fiſh, as before obſerved; and being generally frozen over in Winter ſo as to bear all Sorts of Carriages, it is very convenient to the People for fetching their Wood and other Neceſſaries.

M. *Valvaſor* accounts for the wonderful Phænomena of this Lake in the following Manner: There is (he ſuppoſes) under the Bottom of the Lake another ſubterraneous one, with which it has a Communication by the ſeveral Holes above-mention'd. There is alſo a Lake under a neighbouring Mountain call'd *Javornick*, whoſe Surface is higher than that of the Lake of *Zirchnitz*, and which is poſſibly fed by ſome Rivulets that bury themſelves under Ground, which are common in that Country. When this upper Lake is ſwell'd by great or ſudden Rains, it finds ſeveral Caverns in the Mountain higher than its uſual Surface, through which it flows into the Lake under that of *Zirchnitz*, from whence it riſes through the Holes in the Bottom of that Lake; which Water again falls away after a long Drought, when the Springs that feed the upper Lake under *Javornick* are much decreaſed. That the Waters of theſe Lakes are carried off by ſubterraneous Paſſages, and form a River on the other Side of the

Mountain, M. *Valvaſor* has alſo made appear beyond Diſpute.

IT is remarkable, that ſome of the Paſſages through which the Water aſcends about the Lake of *Zircbnitz* throw up Ducks as well as Fiſh, which Fowls are ſuppoſed to be produced in the Lake under *Javornick*. When they firſt come out they ſwim, but are quite blind, and have few or no Feathers, ſo that they are eaſily caught; but in a ſhort Time they recover their Sight, and in fourteen Days they are fledged, and fly away in Flocks. They are black, only white on the Forehead, and about the Size of the common Wild-Duck. They are well-taſted, but are too fat, having nearly as much Fat as Lean.—It ſeems worth taking notice, that in the Mountain near this Lake there are two very deep Holes or Precipices, in which Wild Pigeons rooſt all Winter, and come out in the Beginning of the Spring; but what they live upon in theſe Caverns is unknown.

WE apprehend it will not be diſagreeable, if to this Account of the Lake of *Zircbnitz* we ſubjoin a few Obſervations on the Lake of *Geneva*, which in ſeveral Reſpects is one of the moſt remarkable in *Europe*. This Lake is ſhaped like a Creſcent, one of whoſe Extremities is eighteen Leagues diſtant from the other, and in the broadeſt Part it is about five Leagues over. Its Depth is very ſurprizing, being in ſome Places, particularly before *Rolle*, not leſs than five hundred Fathoms; and thereabouts, it is ſaid, a Kind of Iſland may be ſeen under Water. The *Rhone* enters the Lake at one of the Points of the Creſcent, and iſſues out at the other, but with this Difference, that whereas it comes in muddy and turbid, it always goes out ſo pure and clear, that under the Bridge of *Geneva*, where the Water is twenty-five Feet deep in Summer, one may ſee the ſmalleſt Stones at the Bottom. This River, upon entring the Lake, loſes its Rapidity, but ſome ſenſible Motion is here and there obſerved, by which its Current is diſtinguiſh'd; and ſoon after its coming out of the Lake it reſumes its rapid Courſe, which, as its Bed becomes narrower, grows conſequently more impetuous*. The Lake is always higher in Summer than in Winter by twelve or fifteen Feet, commonly beginning to increaſe about the End of *January*, and continuing to do ſo till *July* or *Auguſt*; which is generally attributed to the melting of the Snow and Ice from the neighbouring Mountains, though probably there is a Concurrence of other Cauſes. In calm Weather, and even before Sun-riſing, the Lake ſometimes appears as if it conſiſted of ſeveral Pieces differently coloured, which is thought to proceed from the different Images of the adjacent Mountains blended together in the Water; and there is one Part browner than the reſt, which is owing to a gentle Agitation of the Water, cauſed either by a Breath of Wind paſſing through it, or (as ſome think) by Springs at the Bottom, imparting a tremulous Motion to the Surface. The Lake is plentifully ſtored with Fiſh, and it is obſervable that the different Species ſeem to have canton'd themſelves as it were, and to have divided it amongſt them; Trouts being only found in the Current of the *Rhone*, Carp near *Vevay*, *&c.* but ſome Fiſhes that are only Paſſengers, and not Inhabitants of the Lake, ſpread themſelves all over it indifferently. The Trouts taken here are very large, ſome of them weighing fifty Pounds; and ſometimes they catch Pikes of eighty Pounds Weight, and the Pound at *Geneva* is eighteen Ounces.

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* Notwithſtanding the Rapidity of the *Rhone*, its Courſe has been ſometimes ſtopp'd by a ſtrong Weſterly Wind, ſuch as happen'd in the Winter of 1645, which not only uncover'd the Houſes at *Geneva*, but laid bare the Channel of the River above the Bridge, ſo that People paſs'd over dry-ſhod for the Space of an Hour, after which it reſumed its former Courſe. *Gallaſius* in his Commentary on *Exodus*, printed 1560, relates that the ſame Accident happen'd at *Geneva* when he was Miniſter there, a South-Weſt Wind making the *Rhone* recoil into the Lake, and affording a dry Paſſage for an Hour together. Another Cauſe has alſo ſometimes interrupted the Courſe of this River; for in *December* 1652, the *Arva*, which falls into the *Rhone* a little below *Geneva*, ſwell'd to ſuch a Degree, that it not only overflow'd its Banks, but forced the *Rhone* back into the Lake for the Space of fourteen Hours.

HAVING ſaid ſo much concerning the *Alps* at the Beginning of the laſt Chapter, the leſs will be neceſſary here; but as we have not been very particular with regard to their Height, it ſeems proper to take notice, that the Mountains of *Switzerland* are generally allow'd to be the higheſt in *Europe*, not only from barometrical Obſervations, but becauſe they give Riſe to thoſe Rivers which water all the Countries around them; and perhaps they may vie in Height with the moſt conſiderable Mountains in any other Part of the Globe. The *Joch*, a high Mountain in the Territory of *Engelberg* where it borders upon the Canton of *Bern*, has been found by the falling of the Mercury in the Barometer*, according to Dr. *Scheuchzer*'s Calculation, to be 5926 Feet above the Level of the Sea: And yet this is far from being the higheſt Mountain in that Neighbourhood, for next to it riſes another call'd *Titliſberg*, cover'd with perpetual Snow, which is at leaſt a thouſand Feet higher than the *Joch*, and indeed one of the higheſt in the Country.—The *Gemmi* is a very lofty Mountain, over which there is a Paſſage, but only in the Summer, from the Canton of *Bern* to *Leuck* in *Valeſia*. The Deſcent on the South Side of this Mountain is ſteep and frightful beyond Deſcription, being a narrow Path cut on the Side of almoſt perpendicular Precipices, and ſometimes we croſs over the Clefts in the Rocks on Planks or quivering wooden Bridges. The Height of this Mountain, at a Cottage call'd *Zur Dauben*, a reſting Place for weary Travellers, appears by the Barometer to be 6012 Feet, being the higheſt

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* The Barometer is a Machine for meaſuring the Weight of the Atmoſphere, and to ſhew the Variations therein, in order chiefly to determine the Changes of Weather. This Machine is founded on the *Torricellian* Experiment, as it is call'd from its Inventor *Torricelli*, which is a Glaſs Tube fill'd with Mercury, hermetically ſealed at one End, and having the open End immerged in a Veſſel of ſtagnant Mercury. Now the Mercury in the Tube being ſuſtain'd by the Preſſure of the Atmoſphere on the Surface of the ſtagnant Mercury, it follows, that as the Weight of the Atmoſphere diminiſhes, the Mercury in the Tube will deſcend; and on the contrary, as it increaſes, the Mercury will again aſcend; the Column of Mercury ſuſpended in the Tube being always equal to the Weight of the incumbent Atmoſphere. Hence we have a curious Method of meaſuring the Height of Mountains, the Atmoſphere growing

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lighter, and conſequently the Mercury ſinking in the Tube, in Proportion to the Height aſcended. From theſe Principles, ſupported by Obſervations and Experiments, ſeveral learned Men have attempted to derive proper Tables, by which the Altitude of any Place may be determined if the Height of the Mercury be given, or the Height of the Mercury from the given Altitude of the Place; and the Expanſions of the Air likewiſe ſettled, as they anſwer to every Inch or Part of an Inch in the Barometer. Mr. *Derham*, obſerving very nicely the Variation of the Mercury from the Bottom to the Top of the *Monument*, found that at the Height of 82 Feet it fell one Tenth of an Inch, and two Tenths at 164 Feet; and repeating the ſame Experiment, his Obſervations agreed exactly with the firſt Trial. At the Top of *Snowdon Hill* in *Wales*, which is 1240 Yards high, Dr. *Halley* found the Mercury three Inches eight Tenths lower than at the Bottom of the Mountain.

Part of it that is paſſable.—As to the *Avicula*, the *St. Gothard*, the *Furca*, the *Grimſula*, the *Criſpalt*, and a long Chain of other Mountains, which begin in the Upper *Valais*, traverſe the Canton of *Uri*, and ſo run acroſs the Country of the *Griſons* towards *Tyrol*, their greateſt Height above the Level of the Sea may be fix'd in round Numbers at 7500 or 8000 Feet. But the higheſt of all the Mountains of *Switzerland* (ſays Dr. *Scheuchzer*) is the *Stella*, or *Piz Stail*, in the Country of the *Griſons*, the perpendicular Height whereof, according to the Doctor's Obſervations, is 9585 Feet, or 12196 according to *Caſſini*; a Height which the Chamois themſelves ſcarce venture to aſcend.—Whether Dr. *Scheuchzer* has taken notice of the higheſt of the *Alps*, we ſhall not pretend to determine; but it is worth obſerving, that Mr. *Martel*, when he viſited the *Glacieres* of *Savoy*, calculated the Height of *Mont Blanc* (which he ſeems to think the loftieſt of all the *Alps*) to be 12459 Feet above the Level of the *Rhone* at *Geneva*.

FOSSILS.

GERMANY, and the other Countries we are ſpeaking of, abound with Metals and Minerals of various Kinds; and ſome of their Mines are ſo remarkable as to deſerve particular Notice. Amongſt theſe may be reckon'd the *Salt-Mines* near *Eperies* or *Eper* in *Upper Hungary*,

Hungary, which are 180 Fathoms deep, and the Salt runs in ſuch large Veins, that they ſometimes dig Pieces not leſs than ten thouſand Weight; but theſe are uſually cut into ſquare Pieces, two Foot long and one Foot thick, for the Convenience of drawing them out of the Mine. The Colour of the ordinary Stone is ſomewhat grey, but when it is broke and ground for Uſe it becomes as white as if it was refined. Some of the Salt is of a delicate blue, ſome yellow, and ſome as hard and tranſparent as Cryſtal, which is wrought into various little Toys and Utenſils. The Water of this Mine, when boil'd, yields a blackiſh Salt, which they give to their Cattle.—A curious Naturaliſt cannot help admiring in thoſe Pits the *Flowers of Salt*, which grow like the Beard of a Goat, but much whiter and finer; but they are not to be found in all the Cuts, nor at all Times, only appearing according to the Temperature of the Seaſon. Theſe Plumes of Salt are very brittle, will melt in moiſt Places, and diſſolve into a volatile Oil; but they are the pureſt, whiteſt, moſt acid and beautiful Salt that can be imagined. Another Thing remarkable in this Mine is a Chapel, big enough to contain a hundred People, with an Altar, Pulpit, Sacriſty, and Seats, all cut out of a Rock of Salt. In this Chapel divine Service is celebrated once a Year, a *Jeſuit* of *Eper* always preaching the Sermon.

NEAR *Hallein*, in the Archbiſhoprick of *Saltzbourg*, there is a high Mountain, the Earth whereof is mix'd with a Sort of Alum or Saltpetre, which being laid for three or four Weeks in large Trenches fill'd with freſh Water, the earthy Part ſubſides, and the Water is then drawn off and boil'd in huge Iron Pans, till it is quite evaporated and leaves the Salt at the Bottom. This Mountain is pierced in a thouſand Places, ſo that very good Guides are neceſſary to conduct Strangers who have the Curioſity to viſit the ſubterraneous Labyrinth, which is ſeldom done without a great deal of Ceremony. Before they enter theſe Works, they generally repair to a Church upon the Mountain to perform their Devotions, after which they breakfaſt at a Publick Houſe near the Church, and being furniſh'd with proper Dreſſes and other Neceſſaries, every one takes a lighted Candle or Torch in his Hand, and ſome of the Guides go before and others behind the Spectators, leſt they ſhould be frighten'd or loſe their Way in the diſmal Caverns. After they have view'd every thing remarkable, which takes up ſeveral Hours, they go to *Hallein* to dine and be merry.

BUT we ſhall leave theſe Mountains of Salt to take a View of thoſe which contain Treaſures of the moſt valuable Kind, namely, Gold and Silver, conſiderable Quantities whereof are found in divers Parts of *Germany*, and particularly in the Mines of *Hungary*. Of theſe the richeſt in Gold is that of *Chremnitz*, which is about 160 Fathoms deep, is ſeveral *Engliſh* Miles in Length, and has been wrought above 900 Years. The Veins generally run North or Eaſt, and the Miners direct themſelves under Ground by a Compaſs. Some of the Paſſages in this Mine, cut long ago through the Rocks, by being diſuſed are quite cloſed up again, and others are become very narrow, the Rocks growing and uniting by Degrees, eſpecially in moiſt Places. Pieces of pure Gold, of a conſiderable Size, have been ſometimes found in this Mine; but the Gold is generally bedded in a Sort of ſtony Glebe or Ore of ſeveral Colours, ſome white, ſome black, red, or yellow, ſome white with black Spots in it, which is eſteem'd the beſt: Nay, the common yellow Earth of the Country about *Chremnitz* affords ſome Gold, and has been waſh'd and wrought with conſiderable Profit.—They have various Methods of ſeparating the Gold from the Ore, but the moſt uſual one is this. After the Ore is broke and pounded very ſmall, they lay it upon fine Cloths, waſhing and ſtirring it about till the earthy and lighter Parts are waſh'd away, and the heavier metalline Parts are left behind. Theſe Cloths are afterwards waſh'd clean in ſeveral Tubs, and the Water, when ſettled, is pour'd off from its Sediment; which Sediment is again waſh'd and ſtirr'd about, till at length they add Quickſilver to it, kneading it well together, and then waſhing it again in a wooden

Veſſel. The Gold and Quickſilver being thus mix'd together, they ſtrain off as much of the Quickſilver as they can, firſt through coarſe and then through fine Cloths, and the remaining Maſs is laid upon a perforated Plate, ſet over a deep Pan fix'd in the Ground, in the Bottom of which they alſo put ſome Quickſilver. This Pan is cover'd over, and the Cover well luted; and a Charcoal Fire being made upon it, the Quickſilver yet remaining in the Gold is driven down to that in the Bottom of the Pan. The Gold is then taken out and thrown into the Fire, where it undergoes a farther Purification.

OF the Silver-Mines in *Hungary*, thoſe at *Schemnitz* are the moſt noted. They are ſix in Number, one of which call'd *Trinity* Mine is ſeventy Fathoms deep, and being of an earthy Soil its Ore is much eſteem'd. In another of theſe Mines is a large Wheel, twelve Yards in Diameter, which is turn'd by the Fall of ſubterraneous Waters, and works Engines that raiſe the Water from the Bottom of the Mines up to the Place where the Wheel is fix'd; which Water, together with that which turns the Wheel, runs out at the Foot of a Hill through an Opening cut for that Purpoſe. The Ore that is of a blackiſh Colour is reckon'd the beſt, and much of it is mix'd with a ſhining yellow Subſtance, which, if not in too great Quantity, renders the Ore more eaſily fuſible: But as the Ore found in theſe Mines differs in its Mixtures, ſo alſo does it in its Richneſs, ſome of it yielding half Silver, (though this is very rare) ſome of it twenty Ounces, and ſome of it not above an Ounce in a hundred Weight. To ſeparate the Silver the Ore is melted in a Furnace, from whence the Metal runs into a Pan placed in the Earth before it, and there acquires a hard Scum or Droſs, which they take off, and add Lead to the remaining Silver. This being again melted in another Furnace, the Lead, and what other Mixture may yet remain in the Silver, ſwims on the Top like Oil, is blown off by Bellows, and becomes *Litharge*, which is of a paler or deeper Colour according to the Time it continues in the Fire, or the Degree of Heat it undergoes*.

IN the Neighbourhood of *Fridberg* in *Saxony* there are Mines of ſeveral Sorts of Metal, and particularly ſome of Silver, which yield ſuch Quantities that the Elector's Profit ariſing from them is ſaid to amount to 130,000 Pounds *per Annum.*

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* Litharge is diſtinguiſh'd into two Kinds, *viz.* Litharge of *Gold*, and Litharge of *Silver*, according as it reſembles thoſe Metals in Colour: Not that the one is made from Silver, and the other from Gold; but the Difference ariſes only from its having been more or leſs expoſed to the Fire, or containing a greater or leſs Mixture of Copper. It is of a drying, detergent, and gently-aſtringent Quality, and is frequently uſed in external Applications, making the Baſis of ſeveral Plaiſters. Potters uſe Litharges to give a beautiful Gloſs to their Ware; and they are alſo uſed by Painters, Dyers, Skinners, and Glaziers. When mix'd with Wine they give it a ſprightly Colour, but render it very unwholeſome.

Annum. The chief of theſe Mines is above 200 Fathoms deep, and was formerly ſo rich, that an hundred Weight of Ore produced ſixty Pounds of Silver, but commonly a Pound of Ore yields an Ounce and a half or thereabouts. It is computed, that ſince the firſt opening of this Mine, about the End of the twelfth Century, it has yielded above a hundred Millions of Silver. Theſe Mines are ſubject to Damps, which ſometimes kill the Workmen; and the Duſt, which ſettles on their Lungs, frequently throws them into Conſumptions; but they wear Vizards with Glaſs Eyes, to prevent its annoying them as much as poſſible.—We are told that in *Saxony*, as well as in ſome other Places, they diſcover the Veins of Ore, and know where to ſink a Mine, by Virtue of a Sort of Wand call'd *Virgula divina*[*].

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[*] The *Virgula divina*, or *Baculus divinatorius*, is nothing but a forked Branch of a Hazle-Tree, by means whereof ſome People pretend to diſcover Mines, Springs, *&c.* under Ground. The Perſon carries it in his Hand, walking over the Places where he ſuſpects the Ore or Springs to lie, and it is ſaid that the Effluvia exhaling from the Metals, or Vapour from the Water, will cauſe the Stick to incline or point to the Ground, which is reckon'd an infallible Sign of a Diſcovery. We find no mention of this *Virgula* in any Author before the eleventh Century, but ſince that Time it has been in frequent Uſe, and has obtain'd ſeveral fine Names, ſome calling it *Caduceus*, others *Aaron's Rod*, &c. This Artifice made a great Noiſe in *France* towards the End of the laſt Century, and its Advocates

BESIDES theſe precious Metals, the Mines of *Germany* and *Hungary* afford many other curious and uſeful Foſſils. In thoſe of *Saxony* we have juſt been ſpeaking of there is found a Kind of *Sulphur Ore* or *Pyrites*, which being broken into ſmall Pieces, and thrown into earthen Veſſels placed in proper Furnaces, the Sulphur contain'd in the Ore is melted by the Fire, and runs out through a narrow Hole into leaden Veſſels fill'd with Water, where it concretes immediately, and the Subſtance which remains behind contains a conſiderable Quantity of Vitriol. The Sulphur is purified by melting it a ſecond time in Iron Veſſels, and boiling it with the Addition of ſome Linſeed Oil; after which it is either made up in large Lumps, or pour'd into cylindrical Moulds, and ſo form'd into Rolls. Thus prepared it is call'd *Brimſtone*, and vaſt Quantities of this Kind of Sulphur are yearly made in *Saxony*, and tranſported into all Parts of *Europe*.—*Sulphur vivum*, or *Native Sulphur*, is likewiſe found in the Mines of *Germany*, *Switzerland*, and *Hungary*, ſometimes in tranſparent Pieces of a beautiful yellow Colour; but the coarſe, opake, greyiſh Kind is moſt common, being uſually found in flat Maſſes of various Sizes, and ſometimes in whole Strata of a conſiderable Thickneſs. Sulphur is alſo found in the Form of a fine yellow Powder, adhering to the

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endeavour'd to account for it on the Principles of the corpuſcular Philoſophy; but it is now in little Credit.

the Stones and Wood about the Baths of *Aix-la-Chapelle*, thoſe of *Buda* in *Hungary*, and other ſulphureous Springs; in which State it very much reſembles the common Flower of Brimſtone*.

NATIVE *Vitriol* is a Kind of foſſil Salt not uncommon in the *German* and *Hungarian* Mines; and particularly in thoſe of *Goſlar* in *Saxony* there is a fine green Vitriol, very bright and tranſparent, found in the Clefts of the Rocks in great Abundance. In theſe Mines there is alſo a white Vitriol, ſometimes found in Pieces of a compact Subſtance, but moſt commonly in Form of a downy Efflореſcence on the Tops and Sides of the Caverns, which being diſſolved in Water is afterwards boil'd till it concretes into a white Maſs like Sugar, and is then form'd into thoſe large Cakes in which we receive it from abroad. There is another Vitriol of a blueiſh Green which is ſometimes found in the Mines of *Saxony*, but more frequently in thoſe of *Hungary* and *Tranſylvania*; and Dr. *Brown* mentions a red Vitriol in the Gold Mines of *Chremnitz*, which perhaps is the *Chalcitis* of the Ancients. Theſe Vitriols owe their Origin to Iron or Copper, diſſolv'd by the Acid of Sulphur and Water, and again concreted into the Forms wherein they are found. The green Colour is derived from Iron, the blue from Copper, and the white and red proceed from a Mixture of ſome other Subſtances.—As to factitious Vitriols, they are obtain'd by various Methods from vitriolic Waters, Earths, and Stones, and eſpecially from the Pyrites. At *Fridberg* in *Saxony* they burn the ſtony Ore from which the Sulphur has been ſeparated, (as mention'd above) and putting it into a large Veſſel, they pour Water upon it, which imbibes the Vitriol it contains, and being afterwards boil'd to a certain Conſiſtence is let out into Coolers, where the pureſt Part of the Vitriol adheres to Sticks placed there on purpoſe, and the reſt to the Sides and Bottom. In the Neighbourhood of the Copper-Mines in *Hungary*, and ſometimes in the Mines themſelves, there are found ſmall Streams of clear vitriolic Water*, in which if a Piece of Iron be put and immediately taken out again, it is found cover'd with a thin Cruſt of Copper; and if the Iron remain long in the Water, it is gradually diſſolv'd, and the Copper precipitated and left in its Place. This Water being boil'd to a proper Conſiſtence, and ſet to cryſtallize, yields a beautiful blue Vitriol, ſhooting into regular Figures conſiſting of ten Sides, in which Form we find it in the Shops. Theſe Cryſtals, if wetted and rubb'd on the Blade of a Kniſe, give it the Colour of Copper, that Metal being the Baſis of this Vitriol[*].

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* Sulphur in this Form, and indeed in moſt others, is of excellent Service in Diſeaſes of the Lungs, of which it is, by way of Eminence, call'd the *Balſam*; becauſe it promotes Expectoration, and clears and ſtrengthens that Organ. It is therefore very beneficial in a Phthiſis, Aſthma, or Catarrh; and it has ever been a famous Medicine in cutaneous Diſeaſes, whether uſed inwardly or outwardly. Externally applied it diſcuſſes hard Tumors; and taken inwardly it is laxative, and promotes inſenſible Perſpiration.

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* In the *Philoſophical Tranſactions*, N° 384, we have an Account of the Body of a Man found under Water in a Copper-Mine eighty-two Fathoms deep, where he had been kill'd by the falling in of a Rock, which had cruſh'd both his Legs and his Right Arm, but his Face, his Body, and his Cloaths were all preſerv'd entire and free from Putrefaction by means of the Vitriol with which the Water was impregnated. He was

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taken up in the Year 1719, and was well known by an old Miner, who remember'd his going down by himſelf into the Mine in 1670, after which the Man was miſſing and ſuppoſed to be ſmother'd in the Ruins. This Account was confirm'd by ſeveral others, and particularly by an old Woman, to whom he had been contracted. He had therefore lain under Ground forty-nine Years; and not only his Cloaths and Linen, but his Fleſh and Skin, which were almoſt as hard as Horn, had been preſerv'd from Corruption by the vitriolic Water.

[*] The Uſes of Vitriol are very great, both in Medicine and Mechanics. The white Sort is frequently uſed in Collyriums, to allay an Inflammation of the Eyes, and ſtop their Running; and, when properly purified, it is a gentle and ſafe Emetic. The Powder of the blueiſh-green is an excellent Styptic, as the Miners know by Experience, who always apply it to their Wounds to ſtop the bleeding. Vitriol is much uſed by Dyers and Hatters, eſpecially the factitious Green which we call *Copperas*; and this is alſo a principal Ingredient in Writing Ink, though the white is greatly preferable for that Purpoſe.

WE ſhould far exceed our Limits, if we ſhould attempt a Deſcription of all the Foſſils to be found in the Mines of *Germany*, *Hungary*, and *Tranſylvania*, ſuch as Antimony, Biſmuth, Orpiment, and a great Variety of others. *Hungary* has Mines of Quickſilver, which afford great Quantities; but thoſe in the County of *Goritia*, a Part of the Province of *Friuli* belonging to the Houſe of *Auſtria*, are perhaps the richeſt of the Kind in *Europe*, the Ore generally containing half, and ſometimes two Thirds of Quickſilver. Theſe Mines are at *Idria*, and the Entrance into them is in the Town itſelf, from whence to the deepeſt Part is above 120 Fathoms. The Quickſilver is ſometimes found in its native State, lodged in the Cavities of the Stones, and guſhing out in a Stream when the Miners break them, and this is call'd *Virgin Quickſilver*; but it is more uſually found in the Form of Ore, which is pounded and waſh'd and diſtill'd in large Iron Retorts, from whence the Mercury comes over pure into the Receiver. Eight hundred Retorts are employ'd at a time in the Furnaces belonging to the Mines of *Idria*; and we may judge of the vaſt Quantities of Quickſilver procured from theſe Mines, by what Dr. *Brown* tells us, *viz.* that when he was there he ſaw in the Caſtle above 470 Tons of it in Barrels, and in another Place as much Ore as would take up two Years to diſtil*.

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* Quickſilver, which was reckon'd poiſonous by the Ancients, is now found to be a moſt excellent Medi-

THE Mines of *Bohemia* and *Sileſia* yield conſiderable Quantities of Gold and Silver, as well as of the baſer Metals; but having ſaid ſo much concerning the Mines of *Hungary* and *Saxony*, we need not enlarge on this Part of our Subject. However, we ought not to conclude this Article without obſerving, that *Bohemia* and *Sileſia* abound more with Agates, Garnets, Sapphires, Amethyſts, and other precious Stones, than any Part of *Germany*, or indeed of *Europe*. Of the Agate and Garnet we have already taken ſome Notice in the Chapter which treats of *Spain* and *Portugal*; the other Gems here mention'd require a brief Deſcription.

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cine when judiciouſly adminiſter'd, and has been of late Years uſed with great Succeſs in many Diſtempers, which before were eſteem'd extremely obſtinate, if not incurable. It opens the Pores, ſmall Veſſels, and Ducts of the Glands, attenuates viſcid Humours, and diſſipates Concretions, even in the remoteſt Parts of the Body. Whether taken inwardly, or applied outwardly by Unction, it diſcharges the Humours by Stool, Sweat, and inſenſible Perſpiration; but its uſual Method of operating is by the Evacuation of a mucous *Saliva*, whence it is call'd a *Salivation*. This is thought the moſt effectual Remedy yet diſcover'd for the Venereal Diſeaſe; tho' ſeveral eminent Phyſicians condemn the Practice of ſalivating as contributing nothing to the Cure, the full Effect of the Medicine being to be had without putting the Patient to that unneceſſary Torture. — Quickſilver is of conſiderable Uſe in Gilding, making Looking-glaſſes, refining Gold, *&c.* but its Effluvia are very pernicious, as the Workmen employ'd about it know by

THE *Sapphire*, which ſome call the Gem of Gems, is a very beautiful Stone, of a deep Sky-Blue, approaching neareſt to the Diamond in Luſtre, Tranſparency, and Hardneſs. This is the fineſt and moſt valuable Kind of Sapphire, but thoſe of *Bohemia* and *Sileſia* are ſomewhat ſofter and of a paler Blue, and are improperly call'd by our Jewellers *Water-Sapphires*. Some of theſe Gems have no Colour at all, being pellucid as the cleareſt Water, and reſembling a Diamond; and others have a white milky Caſt, with a ſlight Tinge of Blue amongſt it. They are found of various Forms and Sizes, ſometimes three Quarters of an Inch, but ſeldom above one Sixth of an Inch in Diameter. A Sapphire of the deepeſt Blue may be perfectly deprived of its Colour by Fire, ſo as to reſemble thoſe which are naturally colourleſs,

Experience: And it is obſerv'd, that the Miners, tho' of the ſtrongeſt Conſtitutions imaginable, ſeldom remain four Years in a healthy State, but are ſeiz'd with Tremblings and Palſies, and die in a miſerable Manner. Indeed the Subtilty and penetrating Nature of this Mineral is very ſurprizing; for Dr. *Pope* tells us, that he ſaw a Workman in the Mines of *Friuli*, who in half a Year's time was ſo impregnated with the Mercury, that putting a Piece of Braſs in his Mouth, or rubbing it between his Fingers, it would turn white as Silver. We may add, that by an injudicious Uſe of Quickſilver, whether outwardly or inwardly, the Nerves are weaken'd, corrupted, and contracted; whence Tremors, Palſies, and too great an Attenuation of the Fluids, which often brings on a fatal Salivation, Ulcers in the Mouth and Throat, and incurable Looſeneſſes.

and even to paſs for a Diamond.—The Sapphires brought from the *Eaſt-Indies* are call'd *oriental*, and thoſe found in *Europe* are term'd *occidental*; which latter, though often very beautiful, are inferior to the former both in Luſtre and Hardneſs.

THE *Amethyſt* is a Gem of a beautiful Colour, being a Mixture of Blue and Red, which, as either of theſe Tinges prevail, form different Degrees of Purple. Sometimes it is found quite colourleſs; and whether naturally ſo, or diveſted of its Colour by means of Fire, it is ſcarce to be diſtinguiſh'd from a Diamond, except by its Degree of Hardneſs. This Gem is found of various Sizes, from that of a ſmall Vetch, to an Inch and a half in Diameter; and its Forms are likewiſe different, being ſometimes roundiſh, ſometimes ſhaped like a Pear, but moſt commonly hexangular and pointed like Cryſtals.—The oriental Amethyſts are generally reckon'd the beſt, but ſome of thoſe found in *Sileſia* and *Bohemia*, as well as in other Parts of *Europe**, are little inferior to thoſe brought from the *Indies*, either in Hardneſs or Beauty.

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* Amethyſts are not uncommon in *Italy*; the *Pyrenean* Mountains, and thoſe of *Auvergne* in *France*, afford very good ones; and ſome of the fineſt Sort are dug out of a Mountain near *Vic* in *Catalonia*, where they are lodged amongſt a reddiſh Earth in the perpendicular Fiſſures of the Rock.—Some have pretended that the Amethyſt worn on the Finger, or drank in Powder, prevents Drunkenneſs, which they ſuppoſe is implied in the Name; but this Virtue, like many more aſcribed to Gems and other Stones, is only imaginary.

BESIDES the *native* Foſſils we have here mention'd, and many more that might be added, *Germany* abounds with thoſe of the *extraneous* Kind, which are Bodies of the animal or vegetable Kingdoms accidentally buried in the Earth, ſuch as Trees, Leaves, Herbs, Shells, Teeth and Bones of Fiſhes or Land-Animals, *&c.* which are found more or leſs alter'd from their original State, according to the Time they have lain, and the Matter wherein they have been immerſed. Of theſe adventitious Foſſils we have given a general Account in ſpeaking of our own Iſland, which affords them in great Abundance; nor can the Reader expect a *particular* Deſcription of them, unleſs in Treatiſes written profeſſedly on the Subject. It is not improper, however, to obſerve, that whole Trees, or conſiderable Parts of them, are moſt frequently found in Bogs or Peat Earth, and ſometimes ſcarce alter'd at all, except in Colour, the Oaks in particular being commonly turn'd to a jetty Black. Branches of Trees are alſo found bedded in Strata of Clay or Stone, and Fragments of Wood, chiefly of Oak, are ſometimes met with among Gravel, and in ſeveral other Strata; and many of theſe being fill'd with cryſtalline or ſtony Particles, but ſtill retaining the Veins of Wood, make a beautiful Figure when they are poliſh'd. Inſtances of Wood perfectly petrified or changed into Stone, at leaſt to Appearance, are not uncomcommon; though many Subſtances have been miſtaken for petrified Wood, and preſerved as ſuch in the Cabinets of the Curious.—As to the ſmaller Plants and Leaves of Trees, they are moſt commonly found immerſed in a black ſlaty Stone over the Strata of Coal, but in *Germany* they are frequently contain'd in a whitiſh Stone ſomewhat harder than Chalk, as well as in ſlaty Stones of different Colours. Theſe Plants are principally of the Fern Kind, and what is very ſurprizing, many of them ſeem not to be of *European* Growth, but peculiar to *America*, and others are of Species to us unknown. The Leaves of Trees moſt frequently found in *Germany* are thoſe of the Willow, White Thorn, and Poplar; alſo the ſmall Branches of Box and Thyme, Ears of Barley, and Moſſes of various Kinds, are there met with in great Perfection. —We ſhall ſay nothing of the ſeveral Species of Corals buried in the Earth, becauſe ſome will not allow them to be extraneous Foſſils, but to have belong'd originally to the Mineral Kingdom. Of animal Subſtances, particularly Shells, Teeth, Bones, *&c.* we find an almoſt infinite Variety, and ſometimes compleat Fiſhes, either cloſely bedded in Stone, or in Strata of a looſer Nature; and amongſt theſe Bodies it is not uncommon to find in this Part of the World the Shells of Fiſhes belonging only to diſtant Seas, as well as ſeveral unknown Species. As to Land-Animals, we have perhaps no Inſtances of their being found entire in the Earth;

but Parts of them are very common, and that in ſuch Places and Quantities as make it really amazing to conſider. The Tuſks and Grinders of Elephants, the Horns of Deer, the Teeth of Horſes and other Quadrupeds, and the larger Bones of divers Kinds of Animals, are often found looſe in the Earth, and ſometimes immerſed in the hardeſt Stone. Some of theſe, by the coppery Particles they have lain amongſt, become ſpotted and vein'd with Blue, which Colour being diffuſed through them by putting them in a gentle Fire, they very much reſemble the native Turquoiſes, ſo as to deceive the Jewellers themſelves: And what we call the *Unicorn-Stone*, the *Unicornu foſſile* of the Shops, is nothing but ſuch a bony Subſtance impregnated with a Kind of earthy Spar, found commonly enough in the Caverns of *Germany*. The Parts of Fiſhes are much more frequent in the foſſil World, than the whole Bodies of them; and yet *Germany* and other Countries afford us many Inſtances of entire Fiſhes found immerſed in Stone, flatted indeed, but perfect in their Forms, and eaſily diſtinguiſh'd as to their ſeveral Species. The *Gloſſopetræ*, vulgarly ſuppoſed to have been the Tongues of Serpents petrified (from whence their Name) are found in vaſt Numbers in *Germany**, and are now well known to be the Teeth of Sharks or other Fiſhes; and ſeveral Miſtakes, with reſpect to the Origin of foſſil Bodies, may probably be yet diſcover'd by more accurate Enquiries. As to foſſil Shells, which are much the moſt numerous Claſs of animal Subſtances buried in the Earth, they are found in moſt Parts of the World, and many of them are extremely beautiful; but we muſt not attempt to deſcribe them, their Variety being almoſt endleſs.

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* The *Gloſſopetræ* are common enough in many Parts of the World, but no where ſo frequent as in the Iſland of *Malta*. They are ſuppoſed good againſt Poi-

HERE, according to our Method, we ſhould give an Account of the *Vegetables* and *Animals* of the Countries we are ſpeaking of; but as theſe Articles would afford us nothing particularly remarkable, we chuſe to paſs them over, and proceed to a Deſcription of ſome miſcellaneous Curioſities, which are not reducible to any certain Heads.

MISCELLANEOUS CURIOSITIES.

SEVERAL Towns in *Germany* are noted for Tuns or Wine-Vats of an uncommon Size, but that of *Heidelberg*, which ſtands in a vaſt Cellar under the Elector's Caſtle, is of all others

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ſons, and particularly the Bites of Serpents; which Virtue ſeems to be ſuperſtitiouſly aſcribed to them from the Viper's faſtening upon St. *Paul*'s Hand without doing him any Harm; and ever ſince (ſay they) no venomous Creature will live upon that Iſland.—But the Origin of theſe Foſſils is now ſo well known, as to deſtroy the Foundation of that vulgar Notion.

the moſt celebrated. The firſt we hear of was large enough to contain 528 Hogſheads of Wine, but this was rebuilt in 1664, and made to hold 600 Hogſheads *Engliſh* Meaſure. The old one had Iron Hoops, each weighing above 1200 Pounds; but the new one was girt about with very ſtrong ones of Knee-Timber, adorn'd with Paintings and Inſcriptions, and ſupported by carv'd Pedeſtals: There was alſo a Stair-Caſe, of forty-three Steps, which led to the Top of it, where the Electors themſelves have had frequent Carouſals. This we apprehend was the Tun that Dr. *Burnet* (afterwards Biſhop of *Sarum*) ſaw at *Heidelberg* in 1686, which he ſays was ſeventeen Feet high, twenty-ſix Feet long, and built with a Strength more like that of the Ribs of a Ship than the Staves of a Tun. It is ſaid this prodigious Veſſel was emptied and broke to pieces by the *French* in 1688, but that another was afterwards made of a yet larger Bulk, which perhaps is ſtill in Being.

THE mentioning a Caſk of ſo enormous a Size puts us in mind of another Curioſity in *Germany*, namely, the great Bell at *Erfurt*, which is reckon'd the largeſt in *Europe*, weighing upwards of twelve Tons, being near eleven Feet in Height, and about as many Yards in Circumference *. We are told the Sound of this Bell may be heard at the Diſtance of four and twenty Miles, which does not appear utterly improbable*.

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* This is far beyond the Weight and Dimenſions of our *Great Tom* of *Oxford*, which is computed to weigh near ſeven Tons and a half, and is above ſeven Feet in

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Diameter. And yet the Bell of *Erfurt* is not to be compared for Weight with ſeveral in *China*, if we may believe the Accounts given us by Father *Le Comte*, who tells us of ſome in *Pekin* that weigh 120,000 Pounds; but indeed we have ſcarce Faith enough to credit him in this Particular.

* It may perhaps ſeem ſtrange to ſome People, to tell them that the Sound of Bells which hang in Plains and Valleys may be heard farther than thoſe which are placed upon Hills; the Reaſon whereof will be underſtood by conſidering, that as Air is the Medium of Sound, the higher the ſonorous Body is placed, the more rarified is that Medium, and conſequently the leſs proper Vehicle to convey the Sound to a Diſtance. We may alſo obſerve, that the Sound of a Bell ſtruck under Water is a Fourth deeper than in the Air, as Mr. *Hawkſbee* and others have found by Experiment; though *Merſenne* ſays it is of the ſame Tone in both Elements.—As to the Diſtance to which Sounds may be ſent, divers Experiments have been made, to try whether there was any Difference in that reſpect between the Northern and Southern Parts of the World. Guns were tried for this Purpoſe at *Florence*, and Perſons appointed to obſerve them near *Legborn* heard the Report plainly enough, though the Diſtance is little leſs than 55 Miles in a ſtrait Line. The *Legborn* Guns are often heard at *Porto Ferraio*, which is above 60 Miles off; and when the *French* bombarded *Genoa*, they heard it at *Monte Nero* near *Legborn*, upwards of 90 Miles diſtant: Nay, People of good Credit have affirm'd, that at the Siege of *Meſſina* the Report of the Guns was heard at *Auguſta* and *Syracuſe*, about 100 *Italian* Miles. Theſe Diſtances being ſo conſiderable induced Dr. *Derham* to ſuſpect, that Sounds fly as far, or nearly as far, in Southern

As great Curioſities as ſome Perſons may reckon the Tun of *Heidelberg* or the Bell of *Erfurt*, there is ſtill a greater, or at leaſt a Work of more Labour, to be ſeen about a League from *Fribourg* in *Switzerland*. It is call'd *Magdalen's Hermitage*, and is deſcribed by M. *Blainville* and our Countryman Mr. *Addiſon*, who both ſaw it, as ſituated among Woods and Rocks, in the prettieſt Solitude imaginable. The Hermit, (they ſay) who was then alive, had work'd out of the Rock a pretty Chapel,

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as is Northern Climates, notwithſtanding we have ſome Inſtances of their being propagated to greater Diſtances in the Northern Parts of the World, than any above mention'd: For Dr. *Hearn* inform'd our Royal Society, that the Guns fired at *Stockholm* in 1685 were heard almoſt 180 *Engliſh* Miles; and in the Naval Engagement between the *Engliſh* and *Dutch* in 1672, the Report of their Guns was heard above 200 Miles off, even as far as *Shrewſbury* and *Wales*.—With reſpect to the Velocity of Sound, the moſt celebrated Philoſophers differ about it; but Dr. *Derham*, by the niceſt Experiments, found that it flies at the Rate of an *Engliſh* Mile in nine Half-Seconds and a Quarter, or 1142 Feet in one Second of Time; and in this he agrees with Mr. *Flamſteed* and Dr. *Halley*. The ſame Gentleman obſerved, that there is ſome Difference, though a very ſmall one, in the Swiftneſs of Sounds with or againſt the Wind, or according as the Wind is ſtronger or weaker, but that nothing elſe accelerates or retards their Motion; that they fly equal Spaces in equal Times; and that all Kinds of Sounds, whether of Bells, Guns, or any other ſonorous Bodies, or whether loud or languid, move with the ſame Degree of Velocity.

with an Altar, Sacriſty, and Steeple; alſo five Chambers, a Parlour, Refectory, Kitchen, Cellar, and other Conveniencies. The Funnel of his Chimney, which pierces from his Kitchen to the Top of the Rock, ſlanting all the Way, is 90 Feet high, and coſt him ſo much Toil, that he was a whole Year about it, and often deſpair'd of finiſhing his Deſign. All this muſt appear the more ſurprizing when we conſider the Dimenſions of the different Parts of this Hermitage, the Chapel being 63 Feet in Length, 36 in Breadth, and 22 in Height. The Sacriſty, or Veſtry, is 22 Feet ſquare, and the Height of the Steeple 70 Feet. The Chamber between the Chapel and the Refectory is above 40 Feet long, the Refectory itſelf is 21, and the Cellar is 25 Feet long, and 10 Feet deep. But the Hall or Parlour is particularly admired, being 28 Paces in Length, 12 in Breadth, and 20 Feet in Height, with four Openings for Windows, much higher and wider than thoſe of our beſt Houſes. At one End of this Hall was the Hermit's Cabinet, with a ſmall Collection of Books and other Curioſities. To add to the Pleaſantneſs and Convenience of this Habitation, he had cut the Side of the Rock into a Flat, and having cover'd it with good Mould had form'd a pretty Garden, planted with divers Sorts of Fruit-Trees, Herbs, and Flowers; and by following the Veins of Water that dropp'd from ſeveral Parts of the Rock, he had made himſelf two or three Fountains,

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which ſupplied his Table, and water'd his little Garden. This Hermit, whoſe Name was *Jean du Pré*, began this laborious Undertaking at the Age of thirty, and ſaid he was twenty-five Years in compleating it, having had no Sort of Aſſiſtance from any Perſon whatſoever except one Servant. He intended to have carried on his Work ſtill farther, but was drown'd in 1708, as he was croſſing a neighbouring River in a Boat with ſome Company that came to viſit him on St. *Antony*'s Day, the Patron of his Chapel. His Place is ſupplied by a Prieſt, who ſubſiſts by the Generoſity of Strangers that come to ſee the Hermitage, whom he generally entertains with Bread and Wine and a Noſegay.

WE might mention here many other Things which are deſcribed as Wonders by thoſe who have travell'd in theſe Countries; but as they ſeem to have much of the Air of Fable, we think it would be waſting our own and our Readers Time to amuſe them with ſuch Uncertainties. The Article of *Antiquities* comes next in Order, but as the Countries we are now ſurveying furniſh nothing of this Kind that is very material, (though noble Remains of *Roman* Works are to be found in ſeveral Places) it ſeems beſt to omit this Part of our Subject, and proceed to that of Buildings.

BUILDINGS.

OUT of ſuch a Multitude of fine Structures, both Churches and Palaces, as we meet with all over *Germany*, it is difficult to determine which are moſt worthy of our Notice, eſpecially as we cannot ſpare Room for many of them to be particularly deſcribed. We ſhall begin, however, with the Cathedral Church of *Vienna*, dedicated to St. *Stephen*, which is a moſt ſtately Fabric and generally admired, though ſome object againſt the Darkneſs of the Inſide, occaſion'd by the painted Glaſs of the Windows. The Steeple and Spire is certainly one of the ſtrongeſt and loftieſt in *Germany*, being 465 Feet high; and under the Croſs on the Top there were formerly the *Turkiſh* Arms, *viz.* a Half-Moon and Star, ſet up by the Citizens when *Solyman the Magnificent* beſieged the City, becauſe he agreed to ſpare the Steeple on that Condition. This Church contains many ſumptuous Monuments of Princes and other great Perſons, the Altars are richly adorn'd, and upon the Whole the Beauty of the Inſide is anſwerable to its majeſtic Appearance without.

THE Cathedral of *Saltzbourg* is a magnificent Edifice of Freeſtone, having a very ſtately Front, and reckoned one of the compleateſt in *Germany*. It is built in Form of a Croſs, with a lofty Dome which ſeparates the Nave from the Choir. The Inſide of the Church is adorn'd with Pilaſters of *Corinthian* Order, and the Pavement conſiſts of great Squares of Marble of various Colours. The High Altar is of beautiful Marble, whereon is placed, on grand Feſtivals, a Sun of Gold, ſet with precious Stones of immenſe Value; alſo a large Croſs of ſolid Gold, and four golden Candleſticks. Here is an Organ remarkable for its Largeneſs, beſides four others of a leſſer Size; and amongſt the principal Ornaments of this Church we may reckon four Marble Statues bigger than the Life, of St. *Peter*, St. *Paul*, St. *Rupert*, and St. *Virgilius*, of whom St. *Rupert* is ſaid to have been the firſt Biſhop of *Saltzbourg*.

THOSE who have a Taſte for *Gothic* Structures will ſcarce find any in *Germany* more beautiful than the Cathedral Church of *Bamberg* in *Franconia*, which is a vaſt Edifice, having a lofty Steeple and four noble Spires of bold Workmanſhip, ſupported by tall Pillars that appear very light and eaſy: But perhaps a ſhort Account of the Treaſure it contains may be more agreeable than a Deſcription of the Building. The Emperor *Henry* II. was the Founder of this Biſhoprick, and his Tomb with that of his Conſort are to be ſeen in this Cathedral, beſides very fair ones of ſeveral of its Biſhops. In the Treaſury of the Church is ſtill preſerved the Imperial Crown of the ſaid Emperor, conſiſting of ſix Plates of Gold adorn'd with precious Stones; and another of his Empreſs compoſed of two Circles of Gold, ſet alſo with Pearls and Jewels. Here is a Statue of the Virgin five Feet high, all of ſolid Silver; and another of St. *George* on horſeback combating the Dragon, which is of Silver gilt, and ſeven Feet high. Amongſt many other rich Curioſities here are likewiſe two fine Vaſes of Porphyry, a portable Altar of maſſy Gold, a little Tabernacle and a large Chalice of the ſame Metal, a Shrine of Gold for Relicks, and a fine Crucifix of Rock-Cryſtal, the *Chriſt* being of ſolid Gold, and the whole adorn'd with Rubies and Emeralds. To theſe we may add a heavy Croſs of Gold eighteen Inches long, and another yet larger of Silver gilt, both given by the above-mention'd Emperor. Nor ought we to forget one of the greateſt Rarities of this Treaſury, which is a Folio Manuſcript of the Four Goſpels in *Latin*, written upon fine Vellum in a neat *Roman* Character, with ſome *Gothic* Letters interſperſed, and the moſt beautiful Miniatures imaginable. The Covers are of Wood, curiouſly inlaid with Figures in Ivory repreſenting our Saviour's Paſſion, and on a Gold Border are the Heads of the Apoſtles, as are thoſe of the Evangeliſts at the four Corners. —We need ſay nothing of the vaſt Number of Candleſticks, Lamps, Cenſers of Gold and Silver, and other Utenſils belonging to this Treaſury, the Articles we have mention'd being ſufficient to give an Idea of its Riches.

THE Cathedral of *Ulm* in *Swabia*, now belonging to the *Lutherans*, is a lofty and well-proportion'd Structure as any in the Circle, and confeſſedly one of the fineſt in the Empire. It is ſaid to have been above a hundred Years in building, and that the very Shell of it coſt 135,000*l.* Sterling, excluſive of the Windows, whereof there are ſix in the Choir that are moſt beautifully painted. This Church has a large ſquare Tower, and five ſtately Spires, one of which is ſupported by ſix and thirty Pillars. The Tabernacle, which formerly contain'd the conſecrated Hoſt, is a curious Piece of Work, and ſaid to have coſt a hundred thouſand Florins, being a ſingular Kind of Marble, and adorn'd with abundance of Statues. The Choir is full of beautiful Sculptures, repreſenting Pieces of Scripture-Hiſtory: Nor muſt we forget its noble Organ, which was more than twenty, ſome ſay more than thirty Years in compleating. It is 39 Feet high and 28 broad, has ſixteen Pair of Bellows, and above three thouſand Pipes of *Engliſh* Tin, of which the largeſt is thirteen Inches in Diameter*.

IF we look into the *Auſtrian Netherlands*, we find a great Number of beautiful and ſtately Churches, but none finer than thoſe at *Antwerp*.

* As fine an Organ as this is, Dr. *Nicholſon* thought it inferior to ours at *Exeter*, which is ſaid to have Pipes of 15 Inches Diameter; and as to the Number of Pipes, we are told there is an Organ at *Lubeck* conſiſting of ſix thouſand.

The Cathedral of that City is a moſt magnificent Structure, being more than 500 Feet long, and 230 broad; and its Steeple (if it has not been deſtroy'd by the Rage of War, to which theſe Countries have been ſo frequently expoſed) may be juſtly rank'd amongſt the nobleſt in *Europe.* It is 466 Feet high, and is ſuch an excellent Piece of Architecture, that the Emperor *Charles* V, when he made his Entry into *Antwerp*, ſaid *it ought to be put into a Caſe, and ſhew'd only once a Year for a Rarity.* The Altars and Chapels within this great Church are finely adorn'd with Paintings by *Rubens* and other eminent Maſters. Amongſt theſe are ſome good Pieces of *Quintin Maſſey*'s, a Blackſmith of *Antwerp*, whoſe Story is well known*.

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* The Story is, that this Blackſmith falling in Love with a Painter's Daughter, aſk'd her in Marriage; but her Father told him, he would never give her to any one except a Painter. Upon this the Blackſmith went to *Italy*, applied himſelf to Painting, and in a few Years return'd home a greater Maſter than his Sweetheart's Father, and accordingly married her. He is interr'd at the Entrance of the Cathedral of *Antwerp*, where his Effigy is put up with this Inſcription:

Connubialis amor de Mulcibre fecit Apellem.

Which we ſhall venture to give the Reader in *Hudibraſtic* Rhymes:

Love's Pow'r (which very ſtrange to tells is)
A Vulcan *chang'd to an* Apelles.

But thoſe who don't know who *Vulcan* and *Apelles* were, may take it in plain *Engliſh* thus:

Love's Pow'r (can any thing be quainter?)
Transform'd a Blackſmith to a Painter.

WE ought not to leave *Antwerp* without taking notice of the *Jeſuits* Church there, a Structure which is equall'd by few, and ſcarce excell'd by any, whether we regard the Materials, the Workmanſhip, or the Variety of fine Paintings done by the celebrated *Rubens*. The Inſide of it is lined with white Marble, and the Roof ſupported by Columns of the ſame. The great Altar is alſo of Marble, intermix'd with Gold, Porphyry, and Jaſper. The adjoining Chapel of the *Virgin* is no leſs beautiful, where *Rubens* has painted the *Aſſumption* over the Altar, which he uſed to call his favourite Piece; and round it are ſix Statues of Alabaſter, repreſenting the Founders of the Chapel.

FOR fear of dwelling too long on a Subject which is not univerſally pleaſing, we ſhall only mention one more Structure of this Kind, *viz.* the great Church at *Bern* in *Switzerland*, which is a very magnificent Fabric, and may be deem'd a Maſter-piece in *Gothic* Architecture. It has a fine lofty Steeple, and is remarkable for having the largeſt Bell in *Switzerland*, weighing ten Tons and upwards. The great Door is adorn'd with a Repreſentation of the Parable of the wiſe and fooliſh Virgins; and the Sculptures in general, both within and without, are very well executed. There are alſo ſome admirable Paintings in this Church, for which it is ſaid great Sums have been offer'd by the People of *Lucerne*. In Mr. *Addiſon*'s Opinion this is one of the moſt magnificent

Proteſtant Cathedrals in *Europe*; and Dr. *Burnet* ſays it is a very noble Structure, but he adds, that being built on the Top of a Hill, the Ground began to give Way from the Foundation, ſo that to ſecure the Church they have raiſed a vaſt Platform which coſt more than the Church itſelf. The Platform is ſupported by a thick Wall ſtrengthen'd with Buttreſſes, about a hundred and fifty Feet high; and this lofty Walk is much frequented by Company, eſpecially in the Evening, as it affords a beautiful Proſpect.

As we are now going to take a View of ſome of the moſt ſtately Palaces of *Germany*, it may be expected we ſhould firſt caſt an Eye on thoſe belonging to the Imperial Family; but if we believe Baron *Pollnitz*, who repreſents them as Structures not at all ſuitable to the Grandeur of an Emperor, they do not ſeem to merit our Attention. We ſhall therefore begin with the Elector of *Bavaria*'s Palace at *Munich*, which is a noble Structure, fit for the Reception of the greateſt Monarch in *Europe*, with his Guards and Attendants. According to the Marquiſs *Pallavicino*, who has given a full Deſcription of it, it contains eleven Courts, ſix Chapels, twenty Halls, two thouſand ſix hundred large Windows, nineteen Galleries, ſixteen great Kitchens, twelve large Cellars, and forty Apartments all on a Floor, in which are three hundred Rooms, richly furniſh'd, and fill'd with Paintings, Statues, Relievo's, and other Ornaments. One Objection indeed is made to this fine Building, *viz.* that its chief Front, which looks towards a narrow Street, has the Reſemblance of a Convent, to which the Image of the Virgin *Mary* over the great Gate contributes not a little; and it is alſo obſerved, that, having been built at ſeveral times, the Architecture is ſomewhat irregular. The Beauty of the Inſide, however, is confeſs'd on all Hands; but that call'd the *Emperor's Apartment* is particularly admired. The great Hall of this Apartment is a hundred and eighteen Feet long, and fifty-two broad, and is adorn'd with curious Pictures of Sacred Hiſtory on one Side, and Profane on the other, The Chimney-Piece is alſo embelliſh'd with fine Figures, amongſt which is a Statue of Porphyry repreſenting *Virtue* with a Spear in her Right Hand, and a Palm-Branch in her Left. It is ſaid that *Guſtavus Adolphus*, King of *Sweden*, was ſo delighted with this Hall, that he was ſorry he could not get it tranſported to *Stockholm.*—But the late Elector added a new Apartment to this Palace, which, though not ſo large as the Emperor's, ſurpaſs'd it in Elegance and Splendor. It was adorn'd with excellent Paintings, and abundance of antique Buſts and Vaſes, placed upon Tables of great Value; but in the Year 1730 this new Apartment was burnt down by a Fire which broke out in the Night-time, ſo that ſcarce any of the fine Furniture was ſaved, and the Elector and his Conſort narrowly eſcaped the Flames. In the little Chapel belonging to the Apartment of the Electreſs hardly any thing was to be ſeen but Gold, Pearls, and Jewels. The Furniture of the Palace in general was rich beyond Imagination; and in the Treaſury were whole Services of Gold-Plate and other coſtly Veſſels, with an incredible Number of Diamonds, Rubies, and other precious Stones. Add to theſe the many fine Paintings, Statues, Buſts, *&c.* with which the Galleries, Halls, Stair-caſes and Chambers were adorn'd; beſides a very valuable Library, and a vaſt Collection of Coins, Medals, and other Rarities both ancient and modern. But how much of the rich Furniture and Treaſure here mention'd is ſtill remaining in this Electoral Palace, we cannot pretend to ſay with any tolerable Degree of Certainty*.

FROM *Munich* let us make a ſhort Excurſion to the Elector's Palace of *Nymphenbourg*, where the Court frequently reſides; which is charmingly ſituated in the Middle of a large Plain, and affords from the Windows of the ſecond Story a Proſpect of innumerable rural Beauties. The grand Avenue leading to this Palace conſiſts of a double Row of Elms on each Side of a noble Canal, which at each End has a ſpacious Baſon adorn'd with Water-Works. By a Flight of Marble-Steps we aſcend into a very large and lofty Salon, from whence on each Hand there is a Paſſage into ſeveral Apartments richly furniſh'd; and having croſs'd this ſpacious Hall, we deſcend by Marble-Steps into the Gardens. Here the firſt Thing that ſtrikes the Eye is a Parterre of a vaſt Extent, at the Entrance of which there is a great Baſon, with a Group of gilt Figures in it, repreſenting *Flora* receiving Flowers from *Nymphs* and *Cupids*. This Parterre is terminated by a moſt delightful Wood, through which are cut three Walks, whereof the middlemoſt fronts the grand Pavilion of the Palace, and has a

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* It is proper to obſerve, that the late Elector, in his Neceſſities during the War at the Beginning of this Century, was obliged to make uſe of ſome of the Treaſure above-mention'd, and a great deal more was ſeiz'd by the *Imperialiſts* when they were in Poſſeſſion of *Munich*, though afterwards they engaged by Treaty to reſtore what they had taken away: And it is reaſonable to ſuppoſe, that in the laſt War the *Auſtrians* did not leave the rich Moveables of this Palace untouch'd, unleſs the

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Elector took care to have them convey'd away before they made themſelves Maſters of his Capital.—As to Accounts of Buildings and the Moveables they contain, a judicious Reader need not be told, that he muſt not always expect them to be entirely free from Miſtakes, but make proper Allowances for the Alterations occaſion'd by the Fancy or Neceſſity of the Owner, and the Calamities of War, Fire, or other Accidents.

large Canal running the whole Length of it, and ending with a fine Caſcade. The Walk on the Right Hand leads to a ſemicircular Mall, at the Entrance of which is a pretty Pavilion call'd *Pagodebourg*, being built in the Form of a Pagod[*] or *Indian* Temple; and the Furniture of this little Palace is entirely *Indian*, all ſurprizingly neat and elegant. In the Walk on the Left Hand is a larger Building call'd *Badenbourg*, (or the Bathing-Houſe) the Baths whereof are ſpacious, lined with Marble, and adorn'd with Statues and Vaſes; and there is alſo an Apartment richly furniſh'd, and embelliſh'd with Gildings, Paintings, and other Ornaments. This Fabric is ſurrounded with fine Pieces of Water, Caſcades, and Statues; and, in a Word, both Art and Nature ſeem to have ſtrove to render theſe Gardens magnificent and delightful.

THE Biſhop of *Bamberg* has two Palaces in that City, the old, and the new; of which the latter is a vaſt Pile of Free-ſtone, three Stories high, with a very regular Front between two noble Wings, containing grand and commodious Apartments, well furniſh'd, and adorn'd with excellent Paintings. The Building is modern, having been erected by the laſt Biſhop, who alſo built *Pommersfelden*, a Country-Palace or Hunting-Seat about eight Miles from *Bamberg*, reckon'd one of the moſt beautiful and compleat Structures in the Empire. It is likewiſe of Free-ſtone, built in the Form of a Square, with four large Towers, one at each Corner; and all round the Court within there is a noble Piazza. Here is a magnificent Staircaſe, and one of the beſt-contrived in *Europe*, which is beautifully painted, as well as the Cielings of the principal Apartments. The Salon which ſerves as a Paſſage to the Garden is alſo finely painted, and adorn'd with Marble Statues; and all the Furniture and Ornaments of the Palace, as well as the Apartments themſelves, are diſpoſed with the utmoſt Elegance and Judgment.

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[*] This Name the *Portugueſe* have given to the Temples of the *Indians*, *Chineſe*, and other Eaſtern Idolaters. It is alſo uſed to ſignify the Idol adored in the Temple; and is likewiſe the Name of a Gold Coin current in ſeveral Parts of the *Indies*.

HIS *Pruſſian* Majeſty's Palace at *Berlin*, the Capital of the Electorate of *Brandenburg*, is a ſtately Fabric of Free-ſtone, conſiſting of four Stories. It was begun by *Frederic* I. in 1699, and having been the Work of ſeveral Architects, the Fronts are not exactly regular. The Apartments are large, the Cielings lofty and beautifully painted, and the Furniture truly royal, there being particularly ſuch a Quantity of Silver, as is ſcarce to be parallel'd in any other Palace in *Europe*. Moſt of the Tables, Stands, Looking-Glaſs Frames, Chandeliers, Screens, *&c.* are of that Metal; and there is a Buffet, which takes up one entire Side of a

Room, fill'd with Ciſterns, large Baſons, and other Veſſels of Silver gilt. There is a fine Gallery in this Palace, adorn'd with admirable Paintings, done by the beſt Maſters; and on the Cieling are repreſented the principal Actions of the late Elector. On the Side next the Garden is a noble Library, and near to it is a Cabinet of Rarities with a choice Collection of Medals.

SOME might think it a blameable Omiſſion, if we ſhould not take notice of his *Britannic* Majeſty's fine Palace of *Herenhauſen* near *Hanover*; but we think it unneceſſary to deſcribe the Structure, as it is chiefly famous for its beautiful Gardens, which in ſome Reſpects are thought equal to any in *France*, and ſuperior to moſt in the Empire. The Walks are laid out in the moſt elegant Manner, the Wilderneſs of Ever-greens is charming, and here is one of the largeſt and nobleſt Orangeries in *Europe*; alſo a perfect Theatre cut in green Seats, with Arbours and Summer-houſes for the Actors to dreſs in, or retire to as Occaſion requires. They are adorn'd throughout with Statues, Vaſes, and whatever elſe is neceſſary to render them noble and delightful; but above all they are admired for their beautiful Fountains, Caſcades, and other Water-Works.

WE ſhall conclude this Article with a brief Deſcription of the magnificent Town-Houſe at *Augſbourg*, a Structure which merits Obſervation as much as any thing of the Kind in *Germany*.

many. It is a large ſquare Building, all of Freeſtone, except the Portico, which is of reddiſh Marble, crown'd with a Balcony of the ſame, ſupported by ſtately Columns of white Marble. At the Top of the Front juſt below the Pediment, there is a large Spread-Eagle in Braſs, which holds in its Talons a Globe and Sceptre, the whole ſaid to be two and twenty Hundred Weight, and to have coſt above 1800*l.* Sterling: And over the Gate are the City-Arms, ſupported by two brazen Griffins, all of excellent Workmanſhip. The great Hall, which is 110 Feet long and 58 broad, is paved with Marble, and enlighten'd by 52 Windows, and adorn'd with fine Paintings and Statues in Niches. The Cieling is divided into a vaſt Number of Compartments, the Squares and Pannels whereof are embelliſh'd with fine gilded Sculptures and other Ornaments. From this Hall we aſcend into another of equal Beauty and Magnificence, the Workmanſhip of the Cieling being admirable, and every Part of it adorn'd with a Profuſion of fine Sculpture, Gilding, and Painting. In the four adjoining Chambers, each forty Feet ſquare and nineteen in Height, which are cover'd with excellent Pictures, the Magiſtrates give Audience to the Envoys of the Emperor, the Electors, and other ſovereign Princes. There are likewiſe ſeveral Chambers for the Council, the Court of Juſtice, *&c.* all of them fill'd with fine Paintings, and over the Doors are the Buſts of Pagan and Chriſtian

Emperors. Amongſt the many curious Paintings to be ſeen about this noble Edifice, there is one in Freſco upon a Wall, which is fifty Feet long and twenty high, repreſenting *Solomon* in all his Glory receiving the Queen of *Sheba*. —This general Deſcription may ſuffice, without deſcending to Particulars.

ARTS, INVENTIONS. &c.

THE Genius of the *Germans* has appeared in the Invention or Improvement of ſeveral mechanical Arts, and amongſt others they lay claim to the Honour of having invented the curious and uſeful Art of *Printing*. This Art is ſaid to be of very ancient ſtanding in *China*, but then their Manner of printing is quite different from that which obtains in *Europe*; tho' it muſt be own'd the *European* Printing, in its Infancy, was much the ſame with the *Chineſe*. However, as there was then no Correſpondence between *Europe* and *China*, the Paſſage into the Eaſt by the *Cape of Good Hope* being undiſcover'd, there is no Reaſon to charge the *Europeans* with having borrow'd their Art from the *Chineſe*, but each may be allow'd to have fallen upon the ſame Invention, though at very different Times.

PRINTING, according to Father *Le Comte*, has been known in *China* from almoſt all Ages; but the great Difference between theirs and ours is this, that whereas we have but a ſmall

Number of Letters in our Alphabets, by the various Arrangement whereof we can form infinite Volumes, ſo by making our Characters moveable, we are able to print the largeſt Works with an inconſiderable Quantity of Letter, the ſame which ſerv'd for the firſt Sheets ſerving alſo for the ſucceeding ones, by being ſeparated and placed in a different Order. The *Chineſe*, on the contrary, by reaſon of the prodigious Number of their Letters*, find it more eaſy and leſs expenſive to cut them on wooden

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* The Art of joining Letters to form Words, and of combining the one and the other an infinite Number of different Ways, is a Secret unknown to the *Chineſe*. At firſt, like the *Egyptians*, they uſed Hieroglyphics, and painted rather than wrote, ſtriving by the natural Images of Things, as a Bird, a Tree, *&c.* to expreſs and communicate their Ideas to one another. But this Manner of writing was not only very incommodious, but imperfect, as they could but expreſs their Thoughts by Halves, and what they did expreſs was frequently liable to be miſunderſtood; not to mention the Room theſe Pictures took up, which obliged them to write a great deal to ſay very little Matters. To remedy theſe Inconveniencies, they changed their Way of writing by degrees, and even invented ſeveral Characters to expreſs Things that did not come within the Reach of Painting to repreſent, as the Paſſions, Thoughts, Voice, Taſte, and a thouſand other Objects without Body or Figure. From ſimple Strokes they framed others more compound, and contriving one or more Character for every Word, they multiplied their Letters almoſt to Infinity. This ſeems to be the Source of that Ignorance we find among the *Chineſe*, ſo great a Part of their Lives being ſpent in learning their Letters, that they have not

Blocks, making as many Blocks as there are Pages in the Book they intend to print, and theſe of no farther Uſe but for that ſingle Work.

WHO was the firſt Inventor of Printing in *Europe*, in what City and what Year it was firſt ſet on foot, is a Queſtion long diſputed among the Learned, and not yet thoroughly decided. The Cities of *Mentz* and *Straſbourg*, and that of *Haerlem* in *Holland*, are the warmeſt on this Point of Honour, but *Mentz* has alwas had the Majority of Voices; and as this is a City of *Germany*, we think it proper here to propoſe the Pretenſions of each, without entring into a nice Diſquiſition of the Merits of the Cauſe.—*John Mantel* of *Straſbourg*, *John Guttemberg* and *John Fuſt* of *Mentz*, and *Laurence John Koſter* of *Haerlem*, are the Perſons to whom this Invention has been moſt frequently aſcribed, but the firſt ſeems to have had the feweſt Advocates. *Mantel* however, a *French* Phyſician, enters the Liſts in behalf of his Nameſake, and contends that he firſt invented

Time to apply themſelves to the Study of Things, but think themſelves learned if they are able to read. Nay, we are told, that ſcarce any of them know all their Letters; and Father *Le Comte* is of Opinion, the greateſt Doctor amongſt them never underſtood half their Letters perfectly, for he reckons the whole Number to be eighty thouſand.—This is a prodigious Inconvenience to Foreigners, and much complain'd of by the Miſſionaries in that Country.

Printing in the Year 1442, in conſideration whereof the Emperor *Frederic* III. gave him a ſuitable Coat of Arms; and he adds, that *Guttemberg*, whom he had made his Aſſociate, carried the Art to *Mentz*, where he took in *Fuſt* as a Partner.—*Boxhornius*, *Schrevelius*, and other Authors refer the Invention to *Koſter* of *Haerlem* in the Year 1430, adding, that *Fuſt* ſtole away *Koſter*'s Materials, and ſet up Printing at *Mentz*, aſſiſted by his Servant *Peter Schoeffer*, who afterwards married his Daughter, and became his Partner in the Buſineſs; but others aſcribe this Theft to *Guttemberg*.—*Polydore Virgil*, *Paſquier*, &c. will have *Guttemberg* to be the Inventor of Printing; but *Naude* eſpouſes the Cauſe of *Fuſt*, whom he makes the firſt Printer in *Europe*. His Reaſon for aſcribing the Invention to *Fuſt* is, that his Name appears in the moſt early printed Books, as in the *Latin* Bible of 1462, *Tully's Offices* of 1465, and perhaps ſome of a prior Date; and if *Guttemberg* or *Koſter* had a greater or an equal Share in the Invention, it is more than probable they would not have allow'd him to attribute the whole to himſelf and his Son-in-Law *Schoeffer*, as he has done, without contradicting him, and aſſerting their own Right. He adds, that whatever is urged in behalf of *Guttemberg*, *Mantel*, or *Koſter*, is only founded on Reports, Conjectures, and forged Authorities.

BUT the Diſpute is not thus terminated: The Advocates for *Koſter* make uſe of various Arguments in his Favour. Mr. *Ellis* (in the *Philoſophical Tranſactions*) gives an Account of Books printed by *Koſter* of an earlier Date than any of thoſe referr'd to *Fuſt*, and ſome even as early as as 1430 and 1432. At *Haerlem*, it is certain, they ſhew printed Books of that Date, which ſeem to Mr. *Ellis* to put it out of Doubt that the Honour of the Invention belongs to *Koſter*, and that *Fuſt* only eſtabliſh'd the Art in greater Perfection at another Place many Years after. Beſides, it is allow'd on all Hands, that the **De Spiegel onſer Behoedinge** (or *Mirror of our Salvation*) which is ſhewn at *Haerlem* for the firſt printed Book, could never be *Koſter*'s firſt Eſſay. He muſt have made many Trials on leſſer Works, and undoubtedly his firſt Attempts were on looſe and ſmall Leaves, which we may ſuppoſe were eaſily loſt. Upon the Whole, it is no inconſiderable Argument in *Koſter*'s behalf, that the rudeſt and moſt artleſs Performances in Printing ſeem to be his; of which Kind ſome Things without Date are to be ſeen in the King's Library at *St. James*'s, and in the *Bodleian* at *Oxford*. They have the Marks of the utmoſt Simplicity, and may be reaſonably taken for firſt Eſſays, being awkward and coarſe, and the Ink only common Writing-Ink, which was unartfully ſpread upon wooden Blocks, cut in a very clumſy Manner.

WHOEVER therefore were the firſt Printers, or whenceſoever the Hint was taken, ſuch was the Art in its original State, ſeveral Pieces in the *Bodleian* Library and that of *Bennet*'s College being printed in this Way; and the Impreſſion appears to have been made only on one Side of the Leaves, after which the two blank Sides were paſted together. But this Method of printing upon wooden Cuts being found inconvenient, it was not long before an Improvement was thought of, *viz.* the making of ſingle moveable Letters, which was firſt done in Wood, and afterwards in Metal; from which laſt Invention we ought to date the Origin of the preſent Art of Printing, as practiſed throughout *Europe.* This ingenious Contrivance of caſting ſingle Types in Metal is generally aſcribed to the above-mention'd *Schoeffer*, firſt Servant, afterwards Partner and Son-in-Law of *Fuſt* at *Mentz* in *Germany*; ſo that he was properly the firſt Printer, as well as Letter-Founder; and, ſtrictly ſpeaking, the Bible, printed with moveable Types in 1450, or thereabouts, was the firſt printed Book*, which was ſoon followed by Editions of *Auguſtin De Civitate*

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* It is ſaid that *Fuſt* (or *Fauſtus*, as ſome Authors call him) carried a Parcel of his printed Bibles to *Paris*, and offer'd them to Sale as Manuſcripts; but the *French*, conſidering the Number of the Books, and their exact Conformity to each other, even to a Point, and that the beſt Book-Writers could not come up to ſuch Exactneſs, concluded there was Witchcraft in the Caſe, and by indicting him as a Magician, or threatning to do ſo, obliged him to diſcover the Secret. Hence the Origin of the popular Story of Dr. *Fauſtus*.

tate Dei, the Vocabulary call'd *Catholicon*, *Tully*'s *Offices*, and ſeveral other Works.

FROM *Mentz* the Art of Printing ſpread itſelf in a ſhort Time through great Part of *Europe*, and is commonly ſaid to have been brought into *England* from *Haerlem* in 1468, by *William Caxton* a Merchant and Citizen of *London*, who having been abroad in the *Low Countries* for many Years, not only got an Inſight into the Buſineſs, but prevail'd with one of the Workmen to come over and ſet up a Preſs at *Oxford*, where an Edition of *Ruffinus* on the Creed was printed the ſame Year. In 1470 *Caxton* is thought by ſome to have brought the Art to *Weſtminſter*; but a modern Antiquary ſeems to have made it appear, that he did not bring it to *England* till about the Year 1474, and that the firſt Book known to have been printed in *Engliſh*, and by him, was the *Hiſtory of Troy*.

HERE we cannot forbear obſerving, that though we allow the *Germans* the Honour of having caſt the firſt moveable Letters in Metal, and of being the firſt Printers, the Praiſe of having brought thoſe Arts to their preſent Perfection is chiefly owing to other Nations. The *Dutch*, *French*, and *Engliſh*, have all of them contributed towards it; and in particular our Countryman Mr. *William Caſlon*, has of late Years, by mere Dint of Genius, without being bred up to the Art of Letter-Founding, arrived at an Excellency in it far beyond all his Predeceſſors in *England*, and even ſurpaſſing what is uſually done of that Kind in *Holland*, as the beautiful Specimens of his own and his Son's Performances (not unknown to the Curious) ſufficiently demonſtrate. By his Ingenuity and unwearied Application in this Way, we may ſafely affirm, (without being thought guilty of Flattery or Partiality) that he has done Service to his Country and to the learned World in general, and his Reputation deſerves to laſt as long as the Art of Printing can preſerve it.

THE Matter of which the Printing-Letters conſiſt is a compound Metal, made up of Lead, Tin, Antimony, *&c.* mixed in a certain Proportion according to the Diſcretion and Experience of the Founder. Each Letter or Character has its proper *Matrice*, (as they call it) which is a Piece of Copper, whereon the Impreſſion of ſuch Character has been ſtruck by means of a Steel *Punchion*, on one End of which it is graven in Relievo. In order to caſt the Letter, the Matrice is placed at the End of an Iron Mould, incloſed within two thin Pieces of Board, and conſiſting of ſeveral Parts, which have different Names according to their different Uſes. Every thing belonging to the Mould being properly diſpoſed, and the Metal melted over the Furnace, the Workman takes the Mould in his Left Hand, and, dips a little Iron Ladle with a wooden Handle into the Metal, which he pours into the Jet or Funnel of the Mould, whereby it is convey'd to the Matrice; at the ſame time moving his Left Hand briſkly forwards,

wards, that the Metal may run the better. This done, he unbends the Bow, (which is a thick Steel Wire, ſerving by its Spring to preſs and retain the Matrice in its Place) and having open'd the Mould, he takes out the Letter by means of a little Hook, ſhuts it again immediately, replaces the Matrice, and caſts a new Letter: And thus he proceeds with a ſurprizing Expedition till he has caſt the Number requir'd. The Letters are now examin'd, and thoſe that are defective thrown aſide; the Jets or Tails are broken off, and the ſuperfluous Metal, occaſion'd by the Mould's not being exactly cloſed, is cleared away with a Knife. After this the two broad Sides of the Letters are rubb'd on a hard coarſe-grain'd Stone, the Perſon rubbing them having his two Fingers next the Thumb cover'd with a Kind of Finger-Stalls made of Leather, to prevent their being hurt by the Friction; and in turning the Letters he makes Uſe of his Thumb ſo nimbly, without diſcontinuing the Motion, that a By-ſtander might be eaſily deceived, and think they had all the while been rubb'd on one Side only. The Letters thus ground remain ſtill to be juſtified, *i. e.* reduced to an exact Height and Thickneſs; for which Purpoſe they are placed on a Sort of wooden Ruler with a little Ledge at the Bottom, and the narrow Sides are ſcraped, which underwent no Rubbing on the Stone. To make them of an equal Height, they are ranged upſide down in an Inſtrument conſiſting of two long Pieces join'd together by Screws, which being fix'd very faſt between two Cheeks of Wood, a Plane is run along the Bottom of the Letters thus inverted, wherein a ſmall Groove is form'd, and being now compleatly dreſs'd and adjuſted, they are fit for the Printer's Uſe.

AFTER this ſhort View of the Letter-Founder's Art, the Reader may naturally expect ſome Account of the Method of Printing. The Letters then, being caſt and finiſh'd as above deſcribed, are diſtributed, each Kind by itſelf, into wooden *Caſes*, (as they are call'd) which are divided into a proper Number of little Cells or Boxes of different Sizes. Theſe Caſes are placed on a Frame ſomewhat ſloping, in the manner of a Reading-Deſk, that the Workman may reach the upper Boxes the better, and be in leſs Danger of mixing the Letters by ſtretching his Arm over them. The Compoſitor, having a Leaf of the Work to be printed lying before him, ſtands againſt the Middle of the Caſe, holding in one Hand an Iron Inſtrument call'd a *Compoſing-Stick*, and with the other he takes the Letters, Figures, Points, *&c.* out of the Boxes as he needs them, ranges them in the Compoſing-Stick on a Slip of Braſs call'd a *Rule*, and putting Spaces between the Words he forms one Line after another till the Stick is full. He then empties the Lines into a wooden Inſtrument call'd a *Galley*, fills his Stick again, empties as before, and ſo on till he has finiſh'd a Page; which he ties round with a ſmall Packthread, ſets it by, compoſes another, and thus proceeds till the Number of Pages to be printed on one Sheet be compleated. This done, he carries them to a ſmooth hard Stone, placed horizontally like a Table,on which he ranges them in due Order and Diſtance, puts round them a Set of *Furniture* conſiſting of Pieces of Wood of different Dimenſions, unties them, and at laſt faſtens or locks them up in an Iron Frame call'd a *Chaſe*, ſo that the Whole may be lifted up from the Stone, as if it were one ſolid Piece of Metal. In this State the Pages, whether two, four, eight, twelve, or whatever Number is to be printed on one Side of the Sheet, are call'd a *Form*; and the correſponding Pages, to be printed on the other Side, are fix'd in another Chaſe in the ſame manner and at the ſame Diſtance, ſo as to fall exactly on the Back of each other. The two Forms being thus *impoſed*, (as they term it) one Sheet is printed, which is carefully read over, and the Faults occaſion'd by the Compoſitor's Inattention, or the caſual miſplacing of the Letters in the Boxes, are mark'd in the Margin. In order to correct theſe Miſtakes, the Compoſitor lays the Forms upon the Stone, unlocks them, and with a ſharp Bodkin picks out the wrong Letters, puts others in their Room, and makes all other neceſſary Alterations. After this the Sheet generally undergoes a ſecond

Reading and Correction, and is then committed to the Preſs.

THE Printing-Preſs is a very complex Machine, of which it is not eaſy to form an Idea by a bare Deſcription. Its two principal Parts, each whereof is compoſed of ſeveral others, are the *Body* and the *Carriage.* The Body conſiſts of two ſtrong *Cheeks* placed perpendicularly, join'd together at Top by a croſs Piece of Wood call'd the *Cap.* A little below is another Piece call'd the *Head*, which is moveable, being ſuſtain'd by two Iron Pins or *long Bolts* that paſs through the Cap; and in the Head is fix'd a braſs *Nut*, having a female Screw or Worm, which receives the male Screw of the *Spindle.* Through an *Eye* or Hole made in the Spindle is rivetted an Iron *Bar*, by which the Preſs is wrought; and the lower Part, which is tapering and pointed with Steel, is incloſed in a ſquare wooden Frame call'd the *Hoſe*, having two croſs Planks call'd *Shelves* to keep it ſteady. The Point of the Spindle works in a Plug fix'd in a braſs Pan ſupplied with Oil; and this Pan is fix'd to an Iron Plate let into the Top of the *Platten*, which is a ſquare ſmooth Piece of Wood, hanging horizontally, whereby the Impreſſion is made. Underneath all lies another Piece call'd the *Winter*, which bears the Carriage, and ſuſtains the Effort of the Preſs below, as the Head does above, each giving way a little, the one upwards, the other downwards, to make the Pull the eaſier.—On the Carriage are nail'd two long Iron Bars or *Ribs*, faced with Steel; and to the *Plank*, ſuſtain'd by the Carriage, are nail'd ſhort Pieces call'd *Cramp-Irons*, equally temper'd with the Ribs, on which they ſlide when the Preſs is turn'd in or out. Upon the Plank is a ſquare Frame or *Coffin*, containing a hard poliſh'd Stone for the Form to lie on; and underneath the Carriage is fix'd a ſmall Piece of Iron call'd the *Spit*, with a double Wheel in the Middle, round which run leather *Girts*, that are nail'd to each End of the Plank; and by the means of a Handle or *Rounce* at the hither End of the Spit, the Preſſman turns the Plank in and out at Pleaſure. Oppoſite to the Body of the Preſs are the *Tympans*, being two Skins of Parchment paſted on wooden Frames, one ſo ſmall as to lie within the other. The largeſt or outward Tympan is faſten'd to the Coffin by Iron Joints, and between both are placed Blankets, which ſoften the Impreſſion of the Platten on the Surface of the Letters, and render it more equable. To the Top of this outward Tympan is fix'd by Joints a thin Frame of Iron call'd a *Friſket*, which is alſo cover'd with Paper or Parchment, ſo far as is neceſſary to keep the Margin of the Sheet clean, and no farther.— In working at Preſs two Men are generally employ'd, one of whom applies the Ink upon the Form by beating it over with two Balls ſtuff'd with Wool and nail'd to a Kind of wooden Tunnels call'd *Ball-ſtocks*; and the other lays the Sheet on the outer Tympan, turns down the Friſket and Tympan on the Form, which he runs in under the Platten by means of the Spit-handle above-mention'd, gives two Pulls with the Bar to make the Impreſſion, and then turning the ſame Handle the contrary Way he brings back the Form, lifts up the Tympan and Friſket, and takes off the printed Sheet. The Form is then beat over again with the Ink-Balls, another Sheet laid upon the Tympan, and printed in the ſame Manner as before; and ſo the Workmen proceed till they have wrought off the Number of Sheets required. This Form being then taken off the Preſs, the correſponding one is laid on, and the Sheets printed on the other Side, which renders them compleat. To get the Ink off the Forms, they are waſh'd with a ſtrong Lye; and then the Compoſitor, as he finds Occaſion, *diſtributes* the Pages, *i. e.* replaces the Letters in their proper Boxes, to be uſed again in the ſucceeding Sheets.—All this is perform'd, both on the Part of the Compoſitor and the Preſsman, with a Degree of Expedition and Addreſs not eaſy to be imagined.

THE Invention of the *Rolling-Preſs*, for taking off Prints from Copper-Plates engraven or etched, is commonly aſcribed to *Lipſius*; but it appears to be earlier than his Time, (as Mr. *Ellis* obſerves) from a printed Miſſal in the *Bodleian* Library, dated 1481, where there is a Print of the Arms of the See of *Wurtzburg* in *Germany*, and thoſe of the Biſhop, evidently taken off by the Rolling-Preſs, as the Impreſſion of the Plate and other Circumſtances leave no Room to doubt. The Diſcovery of the Art of *Engraving* is indeed ſaid to be as ancient as the Year 1460, and aſcribed to *Finiguerra*, a Goldſmith of *Florence*; however, nothing conſiderable was done in that Way till ſome Years afterwards by *Martin* of *Antwerp*, and then by *Albert Durer* and *Lucas*, who ſucceeded in it to Admiration. About the ſame Time the Method of *Etching* was diſcover'd, that is, of eating the Strokes or Lines in the Copper with *Aqua fortis*, inſtead of cutting them with a Tool or Graver.—As to the Structure of the Rolling-Preſs, it is much more ſimple than that of the Printing-Preſs above deſcribed; and we need only inform the Reader, that the Impreſſion is made by paſſing the Plate, cover'd with the Paper and Blankets, between two wooden Cylinders or Rollers, whence the Machine has its Name.

As the Origin of Printing is generally referr'd to the *Germans*, an Art calculated for the Promotion of Knowledge and the general Good of Mankind, ſo are they likewiſe ſuppoſed to be the Authors of thoſe deſtructive and murdering Inventions of *Guns* and *Gunpowder*. The Diſcovery indeed, like many others, ſeems to have been caſual, and, according to *Polydore Virgil*, the Name of the Inventor is not known. *Thevet* ſays the Perſon was a

Monk of *Friburg*, whoſe Name was *Anelzen*; but other Authors, with more Probability, aſcribe it to *Barholdus Schwartz*, a Friar, who in making chymical Experiments, mix'd ſome Salt-petre and Brimſtone with other Ingredients, and ſet them upon the Fire in a Crucible, into which a Spark happening to get, the Pot ſuddenly burſt with great Noiſe and Violence*. This unexpected Effect ſurprized him at firſt; but repeating the Experiment, and finding it conſtant, he ſet himſelf to work to improve it: To which Purpoſe he cauſed an Iron Tube to be made, with a ſmall Hole at one End; and putting in ſome of his new Compoſition, together with ſome little Stones, he ſet Fire to it, and found it anſwer his Expectations, by penetrating all before it. This *Schwartz* (ſay they) taught the Uſe of Gunpowder to the *Venetians*, who firſt employ'd it in their War with the *Genoeſe* in 1380: But the Invention is undoubtedly of an earlier Date, for we read that when *Alphonſus*, King of *Caſtile*, beſieged the *Moors* in 1343, they diſcharged a Sort of Iron Mortars which made a Noiſe like Thunder: And this is confirm'd by what *Don Pedro*, Biſhop of *Leon*, relates in his Chronicle of King

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* *Polydore Virgil* relates the Story ſomewhat differently, *viz.* that the Ingredients were put into a Mortar cover'd with a Stone, and the Man ſtriking fire near it with Flint and Steel, a Spark accidentally flew in, whereby the Compoſition was inflamed, and the Stone blown up from the Mortar.

Alphonſus, who reduced *Toledo*, namely, that in a Sea-Fight between the King of *Tunis* and the *Mooriſh* King of *Seville* about that Time, the *Tuniſians* made uſe of Iron Tuns or Barrels, from whence they threw Thunderbolts of Fire. Add to this what *Du Cange* tells us, that the Regiſters of the Chamber of Accounts in *France* make mention of Gunpowder as early as the Year 1338. But after all, there is ſufficient Reaſon to think that our celebrated Friar *Bacon* underſtood the Compoſition of Gunpowder long before *Schwartz* was born, or any mention is made of its being uſed in War, as we have already obſerved towards the Beginning of this Work*.

Gunpowder is a Compoſition of Salt-petre, Sulphur, and Charcoal, mixed together and form'd into little Grains, which eaſily takes fire, and is rarefied or expanded with ſurprizing Vehemence†. Writers vary with reſpect to the Proportions of the three Ingredients, but as to the Proceſs there is little Difference. All the Ingredients are firſt finely powder'd, then moiſten'd with fair Water, Spirit of Wine, Vinegar, Urine, or the like, and pounded together in a Mortar for twenty four Hours at leaſt; Care being taken to wet the Maſs from time to time, to prevent its taking fire. It is then form'd into Balls as big as Eggs, which are put into a Sieve with a Bottom of thick Parchment made full of round Holes; and by means of a wooden Ball roll'd about the Sieve along with them, they are broken in pieces, and forced through the little Holes in Grains or Globules, which being dried the Powder is compleat.—To make large Quantities Mills have been invented, whereby more Work is done in one Day, than a Man can do in a hundred.

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* See the *Note*, p. 116.

† The Effect of Gunpowder is not very difficult to be accounted for, if we conſider that the Charcoal it contains takes fire like Tinder, whereby the Sulphur and Salt-petre break into Flame, and the latter expands itſelf to a prodigious Degree, even ſo as to take up (according to Computation) above ten thouſand times the Space it poſſeſs'd before.—Sir *Iſaac Newton* thus explains the Matter: The Charcoal and Sulphur eaſily take Fire, and kindle the Nitre; and the Spirit of the Nitre being thereby rarefied into Vapour, ruſhes out with an Exploſion, much

like the Vapour of Water out of an Æolipile. The Sulphur alſo, being volatile, is converted into Vapour, the Acidity whereof cauſes the greater Fermentation, by which the Heat is augmented, and the Exploſion render'd more quick and vehement. The Exploſion of Gunpowder, therefore, ariſes from the violent Action whereby the whole Mixture being ſuddenly and greatly heated is rarefied into Fume and Vapour; which Vapour, becoming ſo hot as to ſhine, appears in the Form of Flame.—M. *de la Hire* aſcribes all the Force and Effect of Gunpowder to the Spring or Elaſticity of the Air incloſed in the ſeveral Grains, and in the Intervals or Spaces between them. According to him, the Powder being kindled gives Motion to the Springs of the numerous little Particles of Air; which is all the Fire ſerves to do, the whole Effect afterwards being produced by the Air alone.

THE Invention of this deſtructive Powder was naturally follow'd by that of Guns, Cannons, Mortars, and other Inſtruments uſed in the modern Art of War. The firſt Cannons were call'd *Bombardæ*, (from *Bombus)* by reaſon of their Noiſe; and our Word *Bomb* had undoubtedly the ſame Derivation. Theſe military Engines ſeem to have had their Origin before the Middle of the fourteenth Century; for (beſides the Teſtimonies already mention'd) Hiſtorians inform us, that at the Battle of *Creſſy*, in 1346, there were five or ſix Pieces of Cannon in the *Engliſh* Army, with which *Mezeray* ſays the *French* were intimidated, being the firſt time they had ſeen ſuch thundering Machines. As to the Invention of Bombs*, nei-

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* A Bomb is a hollow Iron-Ball or Shell, fill'd with Gunpowder, and thrown out of a ſhort Piece of Ordnance call'd a Mortar. There is a Vent or Aperture left in the Shell, into which a Fuſee or wooden Tube is driven, and faſten'd with a ſtrong Cement. This Fuſee is fill'd with a combuſtible Matter, made of two Ounces of Nitre, one of Sulphur, and three of Gunpowder Duſt, well ramm'd; and this being ſet on fire burns ſlowly till it reach the Powder in the Shell, which goes off at once, burſting it to pieces with incredible Violence. Great Care is to be taken, that the Fuſee be ſo proportion'd as not to ſet fire to the Powder before the Shell arrive at the Place where it is deſigned to fall, otherwiſe it burſts in the Air without doing the intended Execution. —*Maltus*, an *Engliſh* Engineer, is ſaid to have firſt taught any regular Uſe of Mortars, in the Year 1634; but he knew nothing of the Curve the Shot deſcribes in

ther the Time nor the Author is exactly known; for according to M. *Blondel* the firſt Bombs were thoſe thrown by Count *Mansfeld* into the Town of *Wachtendonck* in *Guelderland* in 1588, though others ſay they were uſed almoſt a Century before, *viz.* at the Siege of *Naples* by *Charles* III. in 1495. They began to be uſed in *France* in 1634, and ſince that Time they have been commonly employ'd in Sieges.

THERE is a very uſeful Invention which ſome aſcribe to the *Germans*, *viz.* that of Clocks, ſuch as are now in Uſe amongſt us; at leaſt they may be allow'd to have retrieved the Art, and to have excell'd all the World in the Contrivance of Variety of Motions, not only to ſhew the Courſe of the Hours and Minutes, but even of the Sun, Moon, and Stars; of which the Clocks at *Straſburgh*, *Prague*, and many other Places in *Germany*, are ſufficient Inſtances. The Emperor *Charles* V. had a Watch in the Jewel of his Ring, and in the Elector of *Saxony*'s Stable may be ſeen a Clock in the Pommel of his Saddle.

THE Neceſſity there is of meaſuring Time has given Riſe to many Inventions for that Purpoſe, whereof that of Sun-dials is of great Antiquity; witneſs the Dial of *Ahaz*, who began

its Paſſage, nor of the Difference of Range at different Elevations: And yet there are certain Rules, founded on Geometry, for theſe Things; moſt of which we owe to *Galileo* and his Diſciple *Torricelli*.

gan his Reign 400 Years before *Alexander:* But the Art of Dialling was not brought to its utmoſt Perfection till the late Diſcoveries in Optics and Aſtronomy. The Uſe of the *Clepſydra* is alſo very ancient*, which was a Contrivance to meaſure Time by the Fall of a certain Quantity of Water; as we ſtill do by the running of Sand out of one Part of an Hour-Glaſs into the other. The Invention of Clocks with Wheels, Springs, *&c.* is of a more modern Date, being referr'd to *Pacificus*, Archdeacon of *Verona*, who lived in the ninth Century; though others aſcribe it to *Boethius*, about the Year 510†. Be this as it will, we are certain that the Invention of the Pendulum-Clock, whereby the Meaſure of Time is reduced to the greateſt Exactneſs poſſible, is owing to the happy Induſtry of the laſt Age, the Honour of it being diſputed between *Huygens* and *Galileo.* The former, who publiſh'd a Treatiſe on the Subject, declares that he firſt put it in Practice in the Year 1657; but *Becher* ſtickles for *Galileo*, by whoſe Direction he ſays the firſt Pendulum-Clock was made at *Florence*, and a Pattern thereof brought into *Holland.* This however is certain, that the Invention never flouriſh'd till it came into the Hands of *Huygens*, who inſiſts upon it, that if *Galileo* ever thought of ſuch a Thing, he never brought it to any Degree of Perfection.—The firſt Clock of this Kind, made in *England*, was about the Year 1662, by M. *Fromantil*, a *Dutchman.*

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* This Sort of Chronometer was invented in *Egypt* under the *Ptolemy's*; which the *Egyptians* made Uſe of to meaſure the Courſe of the Sun, as *Tycho Brahe* did in our Days to meaſure the Motion of the Stars; and *Duley* uſed the ſame Contrivance in making his Obſervations at Sea.—As Sun-dials were of Service chiefly in the Summer, ſo were the *Clepſydræ* in the Winter: But they had two Defects; the one, that the Water ran out with more or leſs Facility, as the Air was more or leſs denſe; and the other, that it ran faſter when the Veſſel was full, than when it was almoſt empty. M. *Amontons*, however, has invented a *Clepſydra* free from both theſe Inconveniencies.

† Dr. *Derham* makes Clock-Work of a much older ſtanding, reckoning *Archimedes*'s Sphere, and that of *Poſidonius*, among the Machines of this Kind; not that their Form or Uſe were the ſame with our Clocks, but

THE Invention of *Spring* or *Pocket-Watches* was likewiſe about the Middle of the laſt Century, and the Honour of it lies between Dr. *Hooke* and M. *Huygens*, the *Engliſh* aſcribing it to the former, and Foreigners to the latter.

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as having their Motion from ſome hidden Weights or Springs, with Wheels, Pullies, or ſome ſuch Clock-Work Principle.—Among the curious Inventions of the Ancients in this Way, the Doctor alſo takes notice of *Archytas*'s Dove, which, according to *Aulus Gellius*, was made of Wood, and ſo contrived as to fly about. To this he adds *Regiomontanus*'s wooden Eagle, which flew out of the City, met the Emperor coming towards it, and having ſaluted him turn'd back again, waiting on him to the City-Gates: Alſo his Iron Fly, which at a Feaſt flew from his Hand, and having taken a Round return'd thither again.

Dr. *Derham* is a ſtrenuous Advocate for Dr. *Hooke*, and tells us that he contrived various Ways of regulating Watches, of which one was a Loadſtone. Another was by a ſlender ſtrait Spring, one End whereof play'd backwards and forwards with the Balance, ſo that the Balance was to the Spring as the Bob to a Pendulum, and the Spring as the Rod thereof. A third Method was by two Balances, ſome of which were made with a ſpiral Spring for a Regulator, and others without. One of theſe Watches with a double Balance was made by Mr. *Tompion* in 1675, and preſented to King *Charles* the Second; and the Invention quickly getting into Repute, both at home and abroad, two of them were ſent for by the Dauphin of *France*. Soon after this M. *Huygen*'s Watch with a ſpiral Spring appear'd in *England*, and great Matters were expected from it, as if it would ſerve to diſcover the Longitude. This Watch agreed with Dr. *Hooke*'s in the Application of the Spring to the Balance, but the Pulſes of M. *Huygens*'s were much ſlower, and the Balance, inſtead of turning once round, as Dr. *Hooke*'s, turn'd ſeveral times every Vibration. *Huygens* invented ſeveral other Kinds of Watches, ſome without any String or Chain, to which in particular he gave the Name of *Pendulum Watches*.

REPEATING Clocks and Watches (*i. e.* ſuch as by pulling a String, or other Means, repeat the Hour and Quarters at any Time of the Day or Night) are undeniably the Invention of Mr. *Barlow*, who firſt put the Contrivance in Practice in larger Movements, or Clocks, about the Year 1676; in which he was ſoon follow'd by other Artiſts: But the Application of it to Pocket-Watches was not known till the Reign of King *James* the Second, when Mr. *Barlow* ſolicited a Patent to ſecure his Invention. The Talk of this engaged Mr. *Quare* to put in Execution a like Contrivance, which he had Thoughts of ſome Years before; and as he endeavour'd to prevent Mr. *Barlow*'s obtaining a Patent, a Watch of each Kind was ſhewn before the King and Council, and upon Trial the Preference was given to Mr. *Quare*'s.—Upon the Whole we may obſerve, (without derogating from the Honour due to the *French*, *Germans*, or any other Nation) that as Watches had their firſt Riſe in *England*, ſo there they have arrived at their greateſt Perfection; witneſs the exceeding Value put on an *Engliſh* Watch in all foreign Countries*, for the making of which curious Machines our ingenious Countryman Mr. *Graham* is at preſent in the higheſt Reputation.

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* Notwithſtanding what M. *Savary* (in his *Dictionnaire de Commerce*) ſays in favour of the *French* Watchmakers, it is certain that moſt People in *France* prefer our Watches to their own; and in order to have them with more Eaſe, a Number of *Engliſh* Workmen were invited over in 1719, and ſettled at *Verſailles*, under the Direction of the famous Mr. *Law:* But the Men growing diſſolute, quarrelling with the Clergy, and inſulting the Magiſtrates, they were diſmiſſed of neceſſity, and the Eſtabliſhment fell to the Ground.

AMONGST the Inventions of the *Germans* we ought to take notice of that noble Inſtrument the *Air-Pump*, to which the preſent Age is indebted for ſo many fine Diſcoveries, and which is aſcribed to *Otho de Guerick*, a Conſul or Burgomaſter of *Magdebourg*, who exhibited his firſt Experiments therewith before the Emperor and the States of *Germany* at *Ratiſbon*, in the Year 1654. It is true, ſome have aſcribed the Invention to the Honourable Mr. *Boyle*, and the Engine has obtain'd the Name of *Machina Boyleana*; but this is rather on account of the Improvements made in it, or the various Experiments it was applied to, by that great Philoſopher: For though he had actually made ſome Attempts of this Nature before he knew any thing of what was done in *Germany*, yet he ingenuouſly confeſſes *de Guerick* to have been beforehand with him, and that it was the Information he afterwards received from a Book publiſh'd by *Schottus*, containing an Account of *de Guerick*'s Experiments, which enabled him to bring his Deſign to Maturity. This Machine has been of late Years much improved by the ingenious Mr. *Hawkſbee* and others, and ſeems now to be carried to its utmoſt Perfection.

THE Uſe and Effect of the Air-Pump is to exhauſt the Air out of any proper Veſſel, and thereby make what is popularly call'd a *Vacuum*, which in reality is only ſuch a Degree of Rarefaction as is ſufficient to ſuſpend the ordinary Effects of the Atmoſphere*. Hence therefore we learn, in ſome meaſure, what our Earth would be without the Maſs of Air which ſurrounds it, and how neceſſary it is to the Life, Generation, and Nutrition both of Animals† and Vegetables, and to various other Purpoſes, in which we are apt to think it is not all concern'd.—The Principle on which this Machine is founded is the Elaſticity or Spring of the

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* The Rareſaction or Dilatation of the Air by its own Elaſticity, without the Help of any Heat, is found to be very ſurprizing. In ſeveral Experiments made by Mr. *Boyle*, it dilated firſt into 9 times its former Space, then into 31 times, then into 60, and then into 150. At length, by many Degrees, he brought it to dilate into 8000 times, then into 10000, and laſt into 13679; and yet we know not how much farther it is capable of being expanded. Hence it appears, that the Air we breathe, near the Surface of the Earth, is compreſſed by its own Weight into at leaſt the 13679th Part of the Space it would poſſeſs if it were at Liberty. But if this Air be condenſed or compreſs'd by Art, the Space it takes up when moſt dilated, is to that it poſſeſſes when moſt condenſed as 550000 to 1, according to the ſame Author's Experiments.

† Even the Inhabitants of the Waters need Air as well as thoſe of the Land, tho' not in the ſame Quantity; for it is known that Fiſhes uſe Reſpiration, by paſſing the Water through their Gills, which to them do the Office of Lungs in other Animals.—It is remarkable that ſome Fiſhes, as Eels, will live a long time out of

Air; and the Baſis or eſſential Part of it is a metalline Tube, anſwering to the Barrel of a common Pump or Syringe, having a Valve at the Bottom opening upwards, and a moveable Piſton or Embolus, anſwering to the Sucker of a Pump, furniſh'd likewiſe with a Valve opening upwards; the Whole properly fitted to a Veſſel as a Receiver, from whence the Air is to be exhauſted. The other Parts of it, chiefly reſpecting Conveniency, have been diverſified and improved from time to time; and particularly Mr. *Hawkſbee*, by adding a ſecond Barrel and Piſton to the former, to riſe as the other falls, and fall as it riſes, has made the working of the Engine much eaſier than it was before. To this Gentleman we are indebted for the Structure of the Air-Pump now in common Uſe; but Mr. *Martin* has lately contrived one of a different Form, which he calls a *Portable Air-Pump*, being ſo conſtructed that it may, together with its Receivers, be contain'd in a Box of a ſmall Size, and ſold at a ſmall Price in compariſon of thoſe before invented.

THE Reader muſt obſerve, as we have already hinted, that an abſolute *Vacuum* cannot be obtained by the Air-Pump, *i. e.* all the Air

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the Water; and we are aſſured that in *Holland* they have a Way of fattening Carp, by hanging them up in a Cellar or other cool Place, in a Net full of wet Moſs, with their Heads out, and feeding them with white Bread and Milk for many Days; which Method has alſo been practiſed in *England*.

cannot be exhauſted out of the Receiver, be the Pump ever ſo good, or work'd ever ſo long; for as the Air which is drawn out is only expell'd by the Spring of that which remains behind, if we ſuppoſe every Particle to be exhauſted, the laſt muſt be expell'd without an Agent, or there would be an Effect without a Cauſe, the Abſurdity whereof is evident. However, the Air is dilated by this Machine to ſuch a Degree, that Bodies placed in an exhauſted Receiver are uſually ſaid to be *in Vacuo*; and by this means a vaſt Number of curious Experiments have been made, which have given great Light into the Secrets of Nature, and of which if we mention a few of the moſt remarkable, it perhaps will be an agreeable Entertainment to thoſe who are unacquainted with ſuch Phænomena.

FIRST then, to demonſtrate the *Spring* of the Air, if a Bottle whoſe Mouth is ſecurely ſealed, ſo that no Air can eſcape from within, be placed under a Receiver, and the Air exhauſted from the Surface of the Bottle, the Spring of the included Air will burſt it to pieces. 2. If a Bladder be almoſt emptied of Air, and tied very tight, the Air within will expand itſelf *in Vacuo*, ſo as to make the Bladder appear full-blown. 3. By making a little Hole in the ſmall End of a new-laid Egg, and exhauſting the Receiver, the Bubble of Air contain'd between the Shell and Skin at the great End will expand itſelf ſo as to force the White and Yolk of the Egg through the Hole; and if half the Shell of the Egg thus emptied be taken off, the ſaid Bubble will raiſe up the Skin ſo as to reſemble an entire Egg. 4. A ſhrivell'd Apple will become ſmooth and plump under the exhauſted Receiver, by the Expanſion of the Air contain'd in its Subſtance. 5. Fiſhes are made ſo light by increaſing the Spring of the Air in their Bladders, upon exhauſting the Receiver, that they riſe to the Top of the Water, and cannot again deſcend to the Bottom*. 6 Water heated as hot as the Finger can well bear it, will boil vehemently under the exhauſted Receiver; but upon letting the Air in again the Agitation ceaſes. 7. Freſh Small-Beer placed *in Vacuo* riſes up in Froth, dies, and loſes all its Taſte. 8. Vegetable Subſtances put in Water under the Receiver emit great Quantities of Air from all Parts of their Surface. 9. The *Weight* or *Preſſure* of the Air is ſhewn by exhauſting two hollow braſs Hemiſpheres, which are then compreſs'd together by the external Air ſo as to require a Force to pull them aſunder equal to 188 Pounds, if the Diameter of the Hemiſpheres be four Inches. 10. A Perſon placing his Hand on the Top of an open Receiver, will very ſenſibly feel the Preſſure of the Air on the Back of his Hand, in proportion as the Receiver is exhauſted; and the Spring of the Air contain'd in the Fleſh exerting itſelf at the ſame Time, the Inſide of his Hand ſwells downwards into the Receiver *.

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* It is a Rule in Hydroſtatics, That a Body heavier than ſo much Water as is equal to it in Bulk will neceſſarily ſink, that a lighter will ſwim, and that a Body of equal Weight will reſt in any Part of the Water. Now, by this Rule, if a Fiſh in the middle Region of the Water be of equal Weight with the Element, Bulk for Bulk, the Fiſh will remain there without any natural Tendency upwards or downwards; and if the Fiſh be deeper in the Water, its Bulk becoming leſs by the Compreſſion of the Bladder, and yet retaining the ſame Weight, it will ſink and reſt at the Bottom. On the other hand, if the Fiſh be higher than the Middle of the Water, the Air of the Bladder dilating itſelf, and the Bulk of the Fiſh conſequently increaſing, but not its Weight, it will riſe upwards, and reſt at the Top of the Water.—Probably the Fiſh, by ſome Action or other, can emit Air out of its Bladder, or take it in,

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as there is Occaſion; for Mr. *Ray* obſerves, that in moſt Fiſhes there is a manifeſt Channel from the Gullet to the Bladder, which doubtleſs ſerves for the Conveyance of Air; and there is a muſculous Power in the Coat of the Bladder, whereby the Fiſh can contract it when it pleaſes.—In Confirmation of what has been ſaid with reſpect to the Uſe of the Swimming Bladder in Fiſhes, the ſame Gentleman adds, that if the Bladder happen to be prick'd or broken, the Fiſh cannot raiſe or ſupport itſelf, but immediately ſinks to the Bottom; and that Soles, Plaice, and other flat Fiſhes, which always lie groveling at the Bottom, have no ſuch Bladder that ever he could diſcern.

* The vaſt Weight or Preſſure of the Air, which indeed we do not feel, but are made fully ſenſible of by philoſophical Experiments, is a Matter that muſt lead us to admire the infinite Wiſdom of the great Author of Nature. It is computed that twenty-nine Inches and a half is the mean Altitude to

11. If the Air be exhauſted from a thin Bottle placed under a Receiver, and then ſuddenly let in again, its Weight will inſtantly reduce the Bottle to very ſmall Pieces. 12. If a Piece of Wood be cemented in the lower Part of the Neck of an open Receiver, and Mercury poured upon it, after two or three Exhauſtions the Preſſure of the external Air will be ſo great on the Mercury, as to cauſe it to deſcend

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which the Mercury riſes in the Barometer by the Preſſure of the Air, and conſequently its Weight is taken for the mean Weight of a Column of Air of the ſame Baſe, and as high as the Atmoſphere. Now a Column of Mercury whoſe Baſe is one ſquare Inch, and Height $29\frac{1}{2}$, weighs about 15 Pounds, which is therefore equal to the Preſſure of the Air on every ſquare Inch, and then upon every ſquare Foot it will be 2160 Pounds. In this Proportion the Air preſſes upon all Bodies on the Surface of the Earth; and therefore allowing fourteen ſquare Feet and a half for the Superficies of a Man's Body, it muſt ſuſtain a Preſſure of 31320 Pounds, when the Air is of a mean Gravity. This prodigious Weight would cruſh us into a very ſmall Compaſs, but that it is equal on every Part, and counter-balanced by the equal Re-action of the Spring of the Air within us.—The Difference of the Weight of the Air which our Bodies ſuſtain at one time more than another is alſo very conſiderable, being about 2500 Pounds leſs when the Air is lighteſt than when it is heavieſt; which Difference of Preſſure muſt greatly affect us in regard to the animal Functions, and therefore it is no Wonder we ſometimes ſuffer in our Health by a Change of Weather: Nay, when we conſider that this Variation is often very ſudden, it is ſuprizing that every ſuch Change does not break the Frame of our Bodies to pieces.

through the Pores of the Wood in Form of a beautiful Shower, which will ſhine in a dark Room. 13. The lighteſt and heavieſt Bodies deſcend with equal Velocity *in Vacuo:* Thus a Guinea and a Feather, let fall from the Top of a tall exhauſted Receiver, arrive at the Bottom both together. 14. It appears that Air is neceſſary to the Exiſtence of Fire and Flame; for a Piece of burning Charcoal, or a lighted Candle, is preſently extinguiſh'd in the exhauſted Receiver: Neither will Gunpowder flaſh or make any Exploſion therein, but melt and die away. 15. Air is likewiſe ſhewn to be the Medium of Sounds; for a Bell rung *in Vacuo* is not heard, but as the Air is admitted into the Receiver, the Sound increaſes in Proportion. 16. That Fermentation and Putrefaction depend on the Air, is ſhewn by preſerving Fruits in their native Bloom and Perfection through the Winter in an exhauſted Glaſs: And Eggs, which in the Air ſoon grow ſtale and putrid, retain their Goodneſs a long time *in Vacuo.* 17. How neceſſary Air is to Vegetation appears from hence, that Seed ſown in Earth kept under an exhauſted Receiver will not grow at all[*]. 18. Air is likewiſe abſolutely neceſſary

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[*] A Trial of this was made by ſowing Lettuce-Seed upon ſome Earth in the open Air, and ſome of the ſame Seed, at the ſame Time, upon other Earth in the Glaſs-Receiver of the Air-Pump, which was afterwards exhauſted. The Seed expoſed to the Air grew up

BIBLIOTHECA BODLEIANA

to moſt Sorts of Animals, though ſome will live a long time *in Vacuo*, whilſt others expire preſently†.

THE ſame *Otho de Guerick*, who invented the Air-Pump, contrived a new Sort of *Air-Gun*, which diſcharged Shot by the Rarefaction of the Air, whereas the common Air-Guns produce their Effects by its Compreſſion. Dr. *Pa-*

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an Inch and half high within eight Days, but that in the exhauſted Receiver did not appear. The Air being then re-admitted into the Receiver, in the Space of a Week the Seed ſprung up to the Height of two or three Inches.—See *Phil. Tranſ.* N°. 23.

† Dr. *Derham* obſerved, from divers Experiments he made, that Animals whoſe Hearts have two Ventricles and no *Foramen Ovale*, as Birds, Dogs, Cats, Rats, Mice, *&c.* die in leſs than half a Minute under a ſmall exhauſted Receiver. A Mole died in one Minute: A Bat remain'd *in Vacuo* four Minutes and a half, and revived upon re-admitting the Air; but in twenty Minutes he was dead beyond Recovery. Waſps, Bees, Graſhoppers, and other Inſects, appear'd dead in two Minutes; but revived in the open Air, after they had lain twenty-four Hours *in Vacuo.* Snails continued twenty-four Hours under the exhauſted Receiver, and ſeem'd not much affected. Frogs and Toads bear the Pump a long time, eſpecially the former; one of which recover'd in the open Air, after remaining eleven Hours in the Receiver.—Fiſh are not eaſily kill'd by the Air-Pump, At firſt they appear greatly diſturb'd, ſwoln, and ſickiſh; but Mr. *Hawkſbee* ſays he has kept them a Week *in Vacuo*, and found them as lively as thoſe which had been kept as long in the Air.—Slow-Worms, according to Mr. *Boyle*, will live two or three Days *in Vacuo*, and Leeches five or ſix.

pin improved upon *De Guerick*'s Invention, and Experiments were made before the *Royal Society* to try the Force of his Machine; which was very conſiderable, but not equal to thoſe whoſe Structure is founded on the Compreſſion of the Air. Of theſe the moſt common and portable Kind conſiſts of two Barrels, one of a ſmall Bore, into which the Bullet is ramm'd as in other Guns, and another on the Outſide of this, ſo large as to leave a Space between them, wherein the Air is to be incloſed. Into this Cavity the Air is injected through a Valve by a Syringe fix'd in the Stock of the Gun, and the Diſcharge is made by drawing a Trigger, which opens another Valve, whereupon the compreſs'd Air ruſhes through a Hole into the inner Barrel, and expels the Bullet with great Violence. There is alſo a Contrivance in the Lock, that either the whole Charge of Air may be ſpent at one Exploſion, or only Part of it, and the reſt reſerved for freſh Bullets; but the Force is much the greater, if all the Air be diſcharged upon one ſingle Bullet.—The *Magazine Air-Gun* is ſo contrived, that ten Bullets, lodged in a Cavity near the Place of Diſcharge, may be drawn one by one into the ſhooting Barrel, and ſucceſſively exploded in a very expeditious Manner. Dr. *Burnet* takes notice of a Gunſmith at *Baſil*, who ſhew'd him one of theſe Machines, and pretended the Invention was his own, which muſt be acknowledged to be curious; but as the Diſcharge of Air-Guns is attended with an inconſiderable Report compared to that of Fire-Arms, nor is there any Flaſh like that of Gunpowder to diſcover from what Hand the Shot comes, it ſeems the Intereſt of Mankind (as the Doctor obſerves) to forbid the Uſe of Inſtruments ſo convenient for private Aſſaſſinations.

As the *Germans* have been famous for their Improvement of the Art of *Chymiſtry*, we think this is no improper Place to introduce ſome Obſervations on that Subject. Chymiſtry, or *Chemiſtry*, (as it is now commonly written) is the Art of ſeparating by means of Fire the ſeveral Subſtances of which mix'd Bodies conſiſt, and of compoſing new Bodies by the Mixture of different Subſtances or Ingredients. If we endeavour to find the Origin of this Art, we muſt look back into the Antediluvian World, where it was practiſed, as ſome think, by *Cham* the Son of *Noah*; but the Invention is more commonly aſcribed to *Tubal Cain*, who firſt prepared Braſs and Iron for the Uſe of Man, which he could not have done without a competent Knowledge of Chemiſtry. Profane Authors refer it to *Vulcan*; and ſeveral learned Men have made it appear very probable that *Tubal Cain* and *Vulcan* were the ſame, which ſeems to be confirm'd by the great Reſemblance between their Names. The next Chymiſt we read of is *Moſes*, whoſe Skill in this Art is evident from his burning and pulverizing the Golden Calf, and giving it the People to drink; for the rendring Gold potable is one of the moſt difficult Operations in Chymiſtry: But we are rather inclined to think this was done by a miraculous Power. The Invention of Chymiſtry is by others referr'd to *Hermes Triſmegiſtus*, an ancient King of *Egypt*, from whom it has obtain'd the Name of the *Hermetic Art*. From the *Arabians*, by whom the Art was eſteem'd and practiſed, it ſeems to have had the Name of *Alchymy*; but theſe People render'd it ridiculous by their extravagant ſuperſtitious Reaſonings, and their pretended Tranſmutation of Metals. And here it is to be obſerved, that Chymiſtry at firſt had only Metals for its Object, whereas the Bounds of it have been much enlarged in later Ages, being extended to the animal and vegetable as well as the mineral Kingdom; and the Moderns have applied it with great Succeſs to the Preparation of Medicines for curing the Diſeaſes of the human Body.

AT the Declenſion of the Eaſtern Empire Chymiſtry ſhared the common Fate of the other Arts, and lay buried and neglected till the Time of our Friar *Bacon*, by whom it was in a good meaſure retriev'd. He was follow'd by *Raymund Lully*, *Baſil Valentine*, *Paracelſus*, *Van Helmont*, and others, who ſpread the Art in *Spain*, *Italy*, and *Germany*; and the two laſt eſpecially carried it to ſuch a Length, as to render Medicine almoſt wholly chymical. *Lemery* a *Frenchman*, *Homberg* a *German*, and our ingenious Countryman Mr. *Boyle*, diſpers'd the Darkneſs of the Art, reducing it to ſimple and true Ideas, and aboliſhing thoſe uſeleſs and impracticable Circumſtances, with which ſome of their Predeceſſors had deſignedly clogg'd its Operations. But of all the Moderns none have made greater Improvements in Chymiſtry, or more judiciouſly and beneficially introduced it into Medicine, than the late celebrated *Boerhaave*; who is alſo the fulleſt and beſt Writer on the Subject, having given us the Hiſtory, Theory, and Practice of this noble Art in an orderly and ſcientifical Manner.

IT is well known that the Chymiſts, or rather Alchymiſts of *Germany*, and ſeveral other Countries, have employ'd much Time and Pains in Search of what is popularly call'd the *Philoſopher's Stone*, or a Preparation capable of tranſmuting or exalting impurer Metals, as Tin, Lead, and Copper, into Gold and Silver*.

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* *Borrichius*, a learned *Dane*, has taken great Pains to prove that Alchymy was known to the ancient *Greeks* and *Egyptians*; and *Conringius*, with equal Addreſs, has endeavour'd to ſhew its Novelty. *Kircher* aſſerts, that the *Egyptians* were not ignorant of the Art; but he adds, that the Secrets of it were confined to the Royal Family, and handed down traditionally from Father to Son, without being committed to Writing or made publick: And yet ſome Authors obſerve, that *Diocleſian*, after the taking of *Alexandria*, order'd all the Books written by the *Egyptians* to be burnt, wherein the great Myſteries of Chymiſtry were contained, that it might not

Another Object of their Studies has been to find out an univerſal Medicine, adequate to all Diſeaſes, ſometimes call'd by way of Eminence the *Grand Elixir*; but moſt Alchymiſts are of Opinion that theſe two Things coincide, ſo that

be in their Power to enrich themſelves by that Art, and thereby put themſelves in a Condition of revolting. Be this as it may, the firſt Writer we know of that ſpeaks of making Gold is *Zoſimus* the *Panopolite*, who lived towards the Beginning of the fifth Century, and who has an expreſs Treatiſe *on the divine Art of making Gold and Silver*, ſtill extant in Manuſcript in the *French* King's Library. *Gazeus*, another *Greek* Writer towards the End of the ſame Century, tells us, that *ſuch as are ſkill'd in the Ways of Nature can take Silver and Tin, and change them into Gold.* Hence it appears, that ſome ſuch Art as Alchymy was in Being in that Age, but neither of thoſe Authors relate how long it had been known before. After this Time Writers on the Subject of Alchymy are more frequent, and particularly *Geber* the *Arab*, who is ſuppoſed to have lived in the ſeventh Century, has a Treatiſe on the *Philoſopher's Stone*, from whence the Hint of an univerſal Medicine ſeems to have been taken. But we do not find this myſterious Part of Chymiſtry brought into much Reputation till the fourteenth or fifteenth Century, when it ſpread itſelf throughout *Europe*; and ſince that Time almoſt every Nation has had its Adepts in Alchymy, who have laid Claim to the Secret of the *Philoſopher's Stone*, or a Medicine to cure all Diſeaſes. Such were the Society of *Roſicrucians* in *Germany*, (to name no more) who pretended not only to be Maſters of the *Philoſopher's Stone*, but to be able to protract the Period of Life, and even to reſtore Youth, by means of certain *Noſtrums*, with other Pretenſions equally extravagant.

what will make Gold will cure all Diſtempers*. The making of Gold has been attempted three different Ways, *viz.* firſt by *Separation*; for every Metal yet known contains ſome Gold, but in moſt of them the Quantity is ſo little, that it will not defray the Expence. The ſecond is by *Maturation*, or Ripening, which relates only to Quickſilver; for the Alchymiſts hold Mercury to be the Baſis and Mother of all Metals, that its Weight might be increaſed by purging it from all heterogeneous Bodies, and that by ſubtilizing, purifying, and digeſting it, with much Labour and long Operation, it might be converted into pure Gold. Weight is the inimitable Character of Gold; but could the Impurities of Mercury be quite purged out, which does not appear impoſſible, it would

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* *Kircher* affirms, that the ancient *Egyptians* had a Method of drawing an *Elixir* from the hardeſt and moſt precious Subſtances, which, on account of its Subtility and Perfection they call'd *Heaven*: And this he takes to be that admirable celeſtial Water, capable of removing all Diſeaſes, call'd alſo the *Philoſopher's Stone*, the *Vegetable Seed of Nature*, the *Solar Soul*, &c. But the judicious *Boerhaave* explodes the Notion of a *Panacea*, or univerſal Medicine; and ſhews, from the different Cauſes, Natures, Effects, Seats, and other Circumſtances of Diſeaſes, that ſeveral may be cured by one Medicine, but all by none. He obſerves, that the moſt univerſal Remedies known are *Water*, *Fire*, *Mercury*, and *Opium*; and that by theſe alone, cautiouſly diſguiſed, ſome have acquired the Reputation of univerſal Phyſicians.

(ſay the Alchymiſts) be as heavy as Gold itſelf; and what is as heavy as Gold is Gold, or at leaſt might be made ſuch without any Difficulty. The third Method is that of *Tranſmutation*, or a Way of turning all Metals into Gold, by melting them in the Fire, and caſting into the fuſed Matter a ſmall Quantity of a certain Preparation, upon which the impure Parts are immediately volatilized, burnt, and carried off, and the remaining Maſs changed into pure Gold. Now that which works this Change in the baſer Metals is what is meant by the *Philoſopher's Stone*, and is the grand Secret in Alchymy yet undiſcover'd, though ſeveral have pretended to be Maſters of it, whoſe Veracity on other Occaſions is not to be queſtion'd.

THE Poſſibility of this *Tranſmutation*, or rather *Perfection of imperfect Metals*, as ſome would have it call'd, is a Point much diſputed among Philoſophers, the Alchymiſts ſtrenuouſly maintaining the Affirmative, on Suppoſition that all Metals would equally arrive at Perfection, as being compoſed of the ſame Matter, were it not for the Impurity of their Matrices, that is, of the Places where they are form'd by Nature. All that is required (ſay they) in the Buſineſs of Tranſmutation, is to do that by Art, which Nature does in many Years or Ages. But how is this to be effected? How is ſo impure a Metal as Lead (for Inſtance) to be exalted into Gold? Why, if we conſider the Weight of Lead, there is nothing in Nature ſo heavy, Gold and Mercury only excepted; whence it is plain there is ſomething in Lead that comes very near to Gold, but there is alſo ſome heterogeneous Matter different both from Gold and Mercury. Now if we had any Body which would ſo agitate the Parts of Lead as to purge off all that is not pure Mercury, and had ſome Sulphur to fix the Mercury, would not the Maſs be converted into Gold? If eleven Ounces of Lead be diſſolved by the Fire, and ſo purified as to come to fourteen, we ſhall then have changed it into Mercury, which is ſpecifically heavier than Lead in that Proportion; and if we farther purify the Mercury from fourteen to nineteen, the ordinary Ratio of the Weight of Gold to that of Mercury, we ſhall then have Gold; provided, as before obſerved, we can find a Sulphur to fix the Mercury *.—Such is the Foundation of the *Philo-*

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* The *fixing* of Mercury, among Alchymiſts, denotes the rendering it capable of bearing the Fire without evaporating, and of enduring the Hammer. This they ſuppoſe is to be done by a certain Sulphur, the common Cement of all Metals; and could they find this out, they would be able to make Gold, or at leaſt Silver.—We have an Account in the *Memoirs of the Royal Academy of Sciences*, of a chymical Operation made by M. *Homberg* on the fæcal Matter, or human Excrements diſcharged by Stool; which it was ſuggeſted to him would yield, by Diſtillation, an Oil clear as Water, and without any Smell, that had the Property of fixing Mercury into fine Silver: To procure as promiſing a Matter for this Experiment as he could, he agreed with four healthy

ſopher's Stone, which the Alchymiſts hold to be a moſt ſubtile, fix'd, concentrated Fire, that unites itſelf by a magnetic Virtue to the mercurial Body of any Metal it meets with, volatilizes and throws off all its Impurities, and leaves nothing but a Maſs of pure Gold behind.

THIS is the grand Secret, which Alchymiſts of various Nations, encouraged by Kings, Princes, and Nobles, have been in diligent Search of for many Ages. Vaſt Sums of Money have been advanced, and innumerable Experiments have been tried for this Purpoſe; but all the Learning, Labour, and Expence employ'd about it have not yet been able to make the expected Diſcovery. It is therefore ſurprizing, after ſo many Books written, ſo many Queſtions debated, and ſo many Operations perform'd in vain, relating to the Art of making Gold, that we ſhould ſtill find People purſuing the ſame

young Fellows, whom he ſhut up for three Months, that they ſhould eat nothing but the fineſt Bread, (which he ſupplied them with freſh every Day) and drink the beſt Champaign. After a long Proceſs, and numerous Eſſays on the Excrements they made, he obtain'd the clear inodorous Oil; but it had no Effect on the Mercury, which was the great Point in View. However, though he miſs'd his Aim, he fell on ſomething he did not dream of, *viz.* a *Phoſphorus*; for he found that the *Caput mortuum* of the Oil (ſo the Chymiſts call what remains in the Retort) had the ſurprizing Property of taking Fire of itſelf, being laid on Paper or other combuſtible Matter.

romantic Scheme, which generally ends in the Ruin of the Projectors themſelves, and then perhaps of ſome wealthy Perſons who are infatuated enough to believe them, and riſque their Fortunes in an Undertaking ſo extravagant, and always hitherto unſucceſsful*.

ON this Subject an ingenious *French* Writer juſtly obſerves, that it is Folly to attempt the making of Gold, without knowing the Nature and Eſſence of thoſe firſt Principles which compoſe it; nay, were we as well acquainted with them as we are now ignorant of them, the Manner of uniting and combining thoſe Principles together would be an Operation ſurpaſſing our Skill. Nor is it without wiſe and good Reaſons, that the Creator has concealed from us the Eſſence of Metals and other Bodies, thinking it ſufficient for us to know their Uſes; for had he given us a perfect Knowledge of their Nature, it would have made us inattentive to every thing elſe, and inſtead of applying Gold to thoſe Purpoſes for which it was created, we ſhould have buſied ourſelves in making it, and thereby render'd it leſs valuable, as it became more common. Such a Knowledge would make us break in upon that Order and Oeconomy which Providence has eſtabliſh'd in the

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* *In Search of Gold his Art the Chymiſt tries,*
And vainly hopes what Nature ſtill denies.
Believe me, Friend, the Philoſophic Stone
Is INDUSTRY, *and* INDUSTRY ALONE.

World, and defeat the wiſe End it propoſed in making the Productions of one Country different from thoſe of another; for had we the Art of making Metals, the ſame Degree of Knowledge would enable us to make Wine, by mixing and proportioning the Principles of which it is compoſed, without waiting the Return of the Vintage: We ſhould think it beneath us to ſtand indebted to the common Courſe and Order of Nature, and the uſual Methods of Huſbandry and Agriculture, for a Supply of our Wants, being able to furniſh ourſelves in a ſhorter Way with all the Neceſſaries and Conveniencies of Life, even thoſe which are now the Productions of different Countries. Were we thus perfectly ſkill'd in all the Secrets of Nature, and Maſters of all its Powers, there would be an End of all Commerce, the very Bonds of Society would be broken, and the Inhabitants of the whole Earth be like ſo many recluſe Philoſophers, having all Things within themſelves, and independent one of another: All Intercourſe of Friendſhip and mutual Kindneſs would conſequently ceaſe, Men having no longer Occaſion for any Exchange of Civilities and good Offices; nay, there would be no Opportunity for the Exerciſe of Juſtice, Prudence, Compaſſion, Courage, or Good-nature, according to the Circumſtances of Time, Place, or Perſon. In a Word, ſuch a Knowledge as we have mention'd would neceſſarily be attended with the Loſs of thoſe Virtues, which, together with our mutual Wants, conſtitute the very Life and Soul of Society.

To what we have ſaid on ſome of the moſt ingenious and uſeful Inventions that are generally ſuppoſed to have had their Riſe in *Germany*, we ſhall add a brief Account of the Trade and Manufactures of that Country. Several Cities in *Germany* are famous for making curious Toys in Wood, Ivory, and all Sorts of Metal; and *Nuremberg* in particular has carried on a great Trade in ſuch Commodities, but it is now much decay'd. *Augſbourg* is likewiſe remarkable for its Goldſmith's Wares, Clocks, and all Kinds of pretty Toys, which are ſent into *Poland* and the North of *Europe:* But in moſt Works of this Nature the *Engliſh* Artizans have of late Years excell'd, and ſerved foreign Countries with their Manufactures, to the great Detriment both of *Augſbourg* and *Nuremberg*, which had been in Poſſeſſion of this Trade for ſeveral Centuries. A great Number of Hands are employ'd at *Ulm* in dreſſing Leather, and in the Manufactures of Linen, Cotton, and Fuſtians, beſides their Iron-Wares and Clock-Work; by which it is become one of the richeſt Cities in *Germany*.—But the Imperial City of *Hamburgh*, with reſpect to Commerce, eclipſes all the reſt, and may be ſtiled by way of Eminence the *Port of Germony*, being ſeated with all poſſible Advantages for Trade, both foreign and domeſtic. The *Elbe*, on which it ſtands, and the many other navigable Rivers that fall into it after a Courſe through ſome of the richeſt and moſt trading Parts of *Germany*, furniſh it with all the Product and Manufactures of *Auſtria*, *Bohemia*, and *Upper* and *Lower Saxony*. By the *Havel* and *Sprehe* it has a Trade with the Electorate of *Brandenburgh*, and by a Canal from the *Sprehe* to the *Oder* its Commerce is extended into *Sileſia*, *Moravia*, and *Poland*. There is likewiſe a Channel open'd from the *Elbe* to the *Trave*, for the ſake of Communication with *Lubeck* and the *Baltick* Sea, without the Trouble and Hazard of ſailing round the Coaſt of *Jutland*, and the Obſtructions of the Toll and other Difficulties of the *Sound*. The chief Commodities exported from *Hamburgh* are Linen-Yarn and Linens of ſeveral Sorts and Countries, particularly *Sileſia* Diapers, the Lawns of *Miſnia* and *Luſatia*, Dowlaſſes and other ſtrong Linen from various Parts of *Germany*; Wire of Iron, Braſs, and Steel, chiefly from *Upper Saxony*; Kid-Skins in great Numbers from *Brandenburg*; beſides Pipeſtaves, Wainſcot-Boards, Oak-Plank, Oil, and Whalebone; of which laſt Articles (though they have a very good Share in the *Greenland* Whale-Fiſhery themſelves) they are obliged to purchaſe conſiderable Quantities from the *Dutch*, more than their Ships can ſupply them with, by reaſon of their vaſt Trade up the *Elbe* into *Germany*.

OF the numerous Commodities the *Hamburghers* import from abroad, the woollen Manufactures of *England* are the chief; of which thoſe ſent yearly from *Yorkſhire* only, and generally ſhipp'd at *Hull*, are ſaid to amount to above 100,000*l.* The ſingle Article of Stockings comes to 20000*l.* at leaſt; and, in ſhort, all the *Engliſh* Goods vended at *Hamburgh* amount to ſeveral hundred thouſand Pounds *per Annum.* Theſe Goods are ſent, by the *Elbe* and other navigable Rivers, to innumerable Markets in the Northern Parts of the Empire, and particularly vaſt Quantities are ſold at the Fairs of *Leipſick*, which are reſorted to by Merchants from moſt Countries in *Europe.* Several Manufactures have likewiſe been lately erected at *Hamburgh*, as the Weaving of Damaſks, Brocades, Velvets, *&c.* the making of fine Loaf-Sugar, and the Printing of Calicoes and Linens; all which employ abundance of Hands, and are carried on with great Induſtry and Succeſs. In a Word, from theſe and other Branches of its Commerce that might be mention'd, *Hamburgh* is become a rich and powerful City, and ſtill preſerves its Freedom and Privileges, notwithſtanding the various Attempts of the *Daniſh* Kings to bring it under their Dominion.

THE City of *Bremen*, which ſtands on the River *Weſer*, carries on a very great Commerce; in which reſpect it is reckon'd inferior to none but *Hamburgh* in the whole Empire.

The *Bremeners* ſend to *England*, particularly to *London*, ſeveral Sorts of *German* Linens, and they take off no ſmall Quantities of our Woollen Manufactures, which they diſperſe through the whole Circle of *Weſtphalia*. They likewiſe ſend Ships (as well as the *Hamburghers*) to *France*, *Spain*, *Portugal*, and *Italy*; and alſo to the Whale-Fiſhery of *Greenland*. Their Inland-Trade is very conſiderable to the neighbouring Parts of *Germany*, whither they ſend their Beer, printed Calicoes and Loaf Sugar, but not refin'd to that Perfection as at *Hamburgh*. Their other Commodities are Minerals, Timber, Cattle, and Leather, in dreſſing of which they are very expert; and, upon the Whole, *Bremen* cannot but be a flouriſhing City, having (like *Hamburgh*) enjoy'd a perfect Neutrality for a long Courſe of Years amidſt the Wars of *Europe*.

THE foreign Trade of *Hungary* is not very conſiderable, conſiſting chiefly in the Exportation of their Cattle and Wines. Of the former they ſend incredible Numbers into *Germany*, and even *Auſtria* alone takes off annually about fourſcore thouſand. Some of their Wines, particularly thoſe of *Tokay*, are reckon'd as good as any in *Europe*, and great Quantities are ſent into the neighbouring Countries. They have no Manufactures of Conſequence, except thoſe of Copper and other Hard-Wares, the Country abounding in Metals, Tin only excepted.

As to *Switzerland*, a flouriſhing Trade is not to be expected there, conſidering its Situation amongſt Mountains, its Want of native Commodities to export, and an Inclination in the Inhabitants to erect Manufactures. At *Zurich* indeed they have a conſiderable Manufacture of Crapes and Calicoes, whereof they export large Quantities; but, if we except the Peaſants*, the *Switzers* in general are cloathed with the Manufactures of other Countries. The Merchandiſe they export is chiefly Horſes, Black Cattle, Butter, and Cheeſe; and particularly the *French* take off great Numbers of their Horſes in Time of War to remount their Cavalry and draw their Artillery, beſides what are bought by the *Italians* and other Nations. With Corn and Wine, not having ſufficient of their own Growth, they are ſupplied chiefly from the *Milaneſe* and the Circle of *Swabia*; with Salt from the *Tirol*, the *Franche Comté*, and *Bavaria*; and, in ſhort, they purchaſe of their Neighbours moſt of the Neceſſaries as well as Conveniencies of Life. As therefore their Importations exceed their Exports, and the Balance of Trade is againſt them, their Governors have endeavour'd to prevent the Conſumption of foreign Goods as much as poſſible, by making ſumptuary Laws to retrench all Superfluities, eſpecially in Furniture and Apparel.

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* Dr. *Burnet*, ſpeaking of the Canton of *Bern*, which he ſays is more than a third Part of all *Switzerland*, obſerves, that the Peaſants are generally rich, and the Soil capable of great Cultivation; in which ſome of them ſucceed ſo well, as to have Eſtates to the Value of a hundred thouſand Crowns: But this, he adds, is not common; though ten thouſand Crowns for a Peaſant, is no extraordinary Matter. They live much on their Milk and Corn, which in ſome Places, as about *Payern*, yields an Increaſe of fifteen Meaſures for one.—And the Author of the Remarks upon *Switzerland*, at the End of the Doctor's Travels, takes notice, that the Peaſants have their Houſes furniſh'd with good Feather-Beds, good Chairs, and other Conveniencies; that their Windows are all of Glaſs, and their Linen very neat and white, as well for their Bedding as their Tables.

The End of the FIRST VOLUME.

BIBLIOTECA·BO[illegible]